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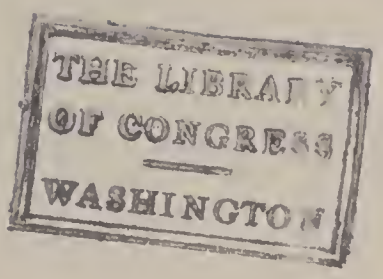
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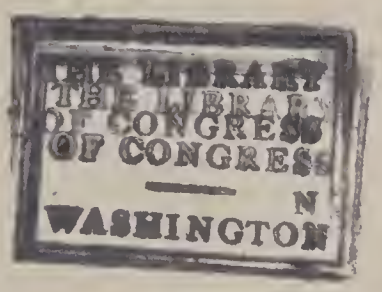
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PUBLISHERS' NOTE.

THE INTERNATIONAL CYCLOPEDIA contains a reprint in full of *Chambers's Encyclopædia* supplemented by some 20,000 copyright articles added by American editors, the whole arranged for consultation under a single alphabet. The total number of titles is now 49,646. The titles of articles from *Chambers's Encyclopædia* are in bold-faced type —**AMERICA**. The titles of the American articles, whether on new topics or enlargements of the old, are in plain capitals—AMERICA. The word *ante* refers the reader to an article from *Chambers's* reprinted in this issue. Whenever the word (*ante*) follows a title in the American additions, it indicates that that article is an enlargement of one under the same title in *Chambers's Encyclopædia*, usually to be found immediately preceding.

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BRAZEN SEA, the large metal vessel, probably of copper, oval shaped, with 12 oxen for a pedestal—the beasts standing in a circle with their heads outward, and the vessel resting on their rumps. It was in the priest's court of Solomon's temple, and held water for the use of the servitors.

BRAZIL', the most extensive state of South America. Towards the interior, it borders on all the other states of South America except Chili and Buenos Ayres—on Uruguay, the Argentine Confederation, Paraguay, Bolivia, Peru, Ecuador, the United States of Colombia, Venezuela, and Guiana, English, Dutch, and French; while its sea-board, beginning about 200 m. to the n. of the Amazon, and reaching to within the same distance of the Plata, projects into the Atlantic fully 1000 m. to the e. of the direct line—pretty nearly a meridian—between its two extremes. This immense country extends between lat. 4° 30′ n. and 33° s. and between long. 35° and 70° w., being, in round numbers, 2600 m. long and 2500 broad. The area, according to official accounts, is 3,200,000 sq. miles. But B. was not always, in point of extent, what it now is. The Portuguese, who, in 1500, accidentally discovered the s. e. coast of the country (but that only after one of the Pinzons had, on behalf of Spain, followed the shores of the continent from its eastern angle to the mouth of the Orinoco), claimed all between the Plata and the Amazon. Soon, however, the Spaniards of Buenos Ayres, feeling that the complete command of their mighty river was to them a necessary of life, colonized the left bank by founding Montevideo. But nearly twenty years earlier, B. had acquired more territory on the Amazon than it was to abandon on the Plata, having, in 1509, wrested from France, then at war with Portugal, what may now be designated Brazilian Guiana. It was only in 1531 that the Portuguese, busy as they were in India, here planted their first settlement. In 1578, B. fell, along with Portugal itself, under the power of Spain—a connection which, besides being essentially detrimental, speedily threw it as a prey into the hands of the Dutch republic; and though Portugal regained its own independence in 1640, it was not until 1654 that B. was entirely recovered from the Hollanders. Thenceforward, the colony entered on a new era. Supplanted, in a great measure, throughout the east by the Dutch, the mother country was now directing most of its attention to its possessions on either side of the Atlantic. About a century and a half later, a still more beneficial change—and that, too, arising from the mother country's own disasters—was inaugurated in the colony. In 1808, under the pressure of French invasion, the monarchy, in the persons of the royal family, was virtually transferred from Portugal to B., an event which, doubtless through British counsels and influence, was immediately followed by the opening of the ports to foreigners. As a remoter benefit, too, of an incident which had no parallel either in English or in Spanish America, B., on shaking off, like its neighbors, the European yoke altogether, found a merely nominal revolution sufficient for its purpose, establishing, or rather accepting, an hereditary empire instead of restless and precarious republicanism; and ever since the transition-period of 1821–25, this consolidated government, with subordinate institutions for local objects, has secured to B.'s twenty vast provinces comparative unity and peace. A war was undertaken in 1865, in concert with the Argentine republic and Uruguay (formerly a province of B.), against Paraguay, which terminated in the defeat of the Paraguayans; and in 1872 Paraguay ceded to B., as a war-indemnity, the long-disputed territory comprised between the Paraguay and the Paraná, n. of the Apa and Igatim. This territory has an extent of about 16,000 sq. miles.

The executive authority is vested in the emperor, who, besides being aided by a council of state, must act through responsible ministers. The legislature consists of two chambers, which sit four months every year. Both the deputies and the senators, who must have annual incomes respectively of 800 millreas and 1600 are indirectly elected by voters, who must possess 200 millreas per annum—the former for four years, and the latter for life. The senate, however, appears to represent the crown as well as the people, inasmuch as each constituency merely nominates three individuals for his majesty's choice of one. Justices of peace, also, are appointed by the respective com-

munities; and in the courts generally, whether civil or criminal, there prevails trial by jury. The budget of 1878–79 gave a revenue of 103,300,000 paper millreas, and expenditure, 107,732,068 (the paper millrea is about half the value of the silver coin, which is about 2*s.*); the public debt in 1877 was 701,952,781 millreas—nearly £35,000,000. The standing army is fixed at 15,000 men on the peace-footing, and at 32,000 on the war-footing; and the standing naval force is fixed at 4000 men, which may be raised to 8000 in time of war. The navy in 1877 consisted of 56 vessels, including 53 steamers and 11 ironclads. In '84, of 41 vessels, including 8 steam ironclads and 21 steam gunboats.

The population in 1872 amounted to 10,108,291 negroes, mulattoes, and Europeans, besides about 1.000,000 aboriginal Indians, who are here proportionally fewer than in most parts of South America. Of the total pop. 1,510,806 were slaves. The Africans continued to be imported till 1854, and their amalgamation with the Europeans produced perhaps the finest variety of the mulatto in the world. A law for the gradual emancipation of the slaves was passed in 1871. It enacts that henceforth the children born of slave women shall be "considered of free condition," but bound to serve the owners of their mothers for the term of 21 years, under the name of apprentices. Roman Catholicism is the prevailing religion. Notwithstanding the recent efforts of the legislature for the advancement of education, it is still very defective. In 1874, the attendance at the public schools was only 140,000.

But physically, as well as politically and socially, B. differs in many respects from most of the other divisions of the new continent. It knows nothing of the volcanoes and earthquakes of the Pacific coast; with winds blowing constantly from the Atlantic ocean, it is exempted from those droughts which are always blighting one or other of the slopes of the Andes, the remoter slope in Peru and Chili, and the nearer in Buenos Ayres and Patagonia; its mines, again, are as famous for gold and diamonds as those of the western Cordilleras for silver. In its hydrography, B. contrasts unfavorably with the other divisions. While the Amazon and the Plata, the Mississippi and the St. Lawrence—not to mention countless rivers of inferior magnitude on both shores—are for the most part practicable almost to their sources, the streams of B., with the exception of the Amazon, are mostly impeded throughout by cataracts and shallows, thus counterbalancing, as it were, its matchless seaward facilities by the deficiencies of its inland communications. Further, the most navigable of these streams, instead of entering the open sea, mingle their waters with those of the Plata or of the Amazon—the Parana and the Uruguay joining the former, and the Madera, the Tapajos, the Zingu, and the Tocantins, the latter; and even among those that do send their tribute at once to the ocean, a similar direction is sometimes impressed by the dividing ridges—the San Francisco, for instance, by far the largest of them, running to the northward parallel with the s.e. coast through 11° of lat., and leaving only 4° of long. for its remaining course to the Atlantic. A humid surface and a luxuriant vegetation conspire to render ordinary roads all but impassible. B. possessed, at the commencement of 1878, railways of a total length of 791 m., and it has also a system of telegraphs, the lines at the same date being 3875 m. in extent. Telegraphic communication has been established between B. and Europe; the first message was despatched by the cable to Lisbon, June 23, 1874.

Among the mineral treasures, besides gold and diamonds already mentioned, iron of superior quality is abundant; and salt, also, is extensively produced in saline marshes by the alternate processes, according to the season, of inundation and evaporation. The productions of the soil, which are, of course, equally various and rich, will be more satisfactorily considered under the heads of the respective localities. Suffice it to say, that the cotton is naturally excellent, and that the tea-plant of China has been introduced, though hitherto with indifferent success. The exports are necessarily different from the different sections of the country. From the n., they are coffee, cotton, cocoa, sugar, and tobacco; from the s., hides, tallow, horns, etc.; and from the middle, drugs, diamonds, gold-dust, dyes, rice, manioc, tapioca, spirits, and rosewood. Their total value in five years, 1873–77, averaged £17,500,000; the corresponding imports averaging £17,000,000. The chief centers of foreign trade, and, along with San Paulo in the interior, the principal cities of the empire, are Para, Maranhão, Bahia, Pernambuco, and Rio de Janeiro. This last-named port, which is likewise the seat of government, is the favorite halting-place of the outward-bound vessels for India, China, and Australia.

BRAZIL (*ante*) comprises 3,288,000 sq.m.; and the several islands adjoining in the Atlantic, the most important of which is Fernando Noronha, 250 m. e. from cape St. Roque, and the penal settlement of the empire. The boundaries of B. are sufficiently described, *ante*. The most striking physical feature of the country is the Amazon river, which with its numerous tributaries affords 30,000 m. of navigation within the territory of the empire. (See AMAZON.) Next in importance is the Tocantins river, which rises in the s. central part of the country, and flows directly n. for 900 m., uniting with the Para branch of the Amazon. The river Araguaya, parallel with and w. of the Tocantins, divides about midway in its course, and afterwards unites, inclosing between its two channels the remarkable Bananal island, 220 m. in circumference, and containing a lake 80 m. in extent. The Turyassu, Maranhao, and Paranahyba are the largest of the other rivers of the n.e. slope. The San Francisco occupies a wide inclosed basin of the eastern highland, and has a course n. and e. of 1800 m., navigable 160 m. from the ocean.

Further s. on the coast slope are the Paraguasu, the Rio de Contas, the Belmenti, the Rio Doce, and the Paranahyba do Sul, all of them to some extent navigable. The great rivers of the southern watershed are the Parana and the Paraguay (q.v.). The Parana rises in a broad basin which extends for 700 m. in width across s. Brazil. The Paraguay has its source in several small lakes between 13° and 14° s., taking in as it flows southward a number of large and small streams, and affording uninterrupted navigation through nearly its whole course, large steamers running up about 1000 m. in a direct line from Buenos Ayres, and smaller craft going 300 m. further. The other large rivers, such as the Xingu, Tapajos, Madeira, Purus, Jurua, Javari, Zapura, Negro, Jamuda, etc., are tributaries of the Amazon.

In respect to elevation, the surface of the country is divided into the higher regions of plateaus, ridges, and broad open valleys, occupying the whole of the country s. of the latitude of cape St. Roque, and the vast lowland plain of the Amazon, extending across the continent to the base of the Andes of Peru, Ecuador, and Colombia, rising in the extreme n. to the ranges which form the boundary of Venezuela and Guiana. The highest and most important mountains in B. are the Serra da Mantiqueira and the Serra do Espinhaço, between 18° and 23° s., and from 100 to 200 m. from the sea-coast. The highest peak has been estimated from 8900 to 10,300 feet. There is a coast range of mountains beginning n. of Rio Janerio, and running both n. and s. not far from the ocean; but none of the peaks exceed 7500 feet. The remarkably even character of the great level of the river provinces may be known from the fact that where the Amazon enters B. at Tabatinga, more than 1500 m. in a direct line from the ocean, the river banks are not more than 250 ft. above sea-level. The rock formation of the mountains is chiefly gneiss. Clay-slates are found between the Parana and the Paraguay, and true carboniferous strata occur in the coal basins s. of the tropic. Carboniferous rocks occur, but Jurassic rocks do not appear. Coral reefs occur along the n. coast. The limestones of the upper San Francisco basin contain the celebrated bone caverns which have been described by Lund, the Danish naturalist. In some of these the remains of extinct animals of high antiquity have been found, such as those of the mastodon, mylodon, glyptodon, toxodon, and megatherium; and with these, stone implements and remains of man so buried with the bones of the extinct fauna as to lead to the conclusion that man was contemporaneous with them. There are no signs of recent volcanic action in B., but warm springs are found in several places, saline and alkaline, varying from 88° to 119°, the warmest at an elevation of 6000 ft. above the sea.

In minerals and jewels B. is very rich. Diamonds were found, in 1786, 300 m. n. of Rio, and at later periods in many other sections. The emerald, ruby, sapphire, topaz, beryl, tourmaline (black, blue, and green), amethyst, garnet, rock crystal, chalcedony, opal, agate, and carnelian are more or less plentiful. There are several large coal basins, and also sulphur, saltpeter, and salt. Gold is abundant in many of the provinces, always accompanied by silver. Silver alone was found in large quantities more than 200 years ago. There are rich mines of mercury not far from the capital; and copper, lead, iron, and manganese are also abundant.

The climate of this immense country is naturally widely varied. In the northern lowlands, between the tropics, it is very hot, with but two seasons in the year—the dry and the wet. In the higher lands it is milder, and in the extreme s. the four seasons are tolerably well marked. The wet season lasts from Dec. or Jan. until May or June, with occasional intervals of fine weather. The other half of the year is dry, but not without occasional showers. The amount of water in the wet season is enormous, often producing a rise of 40 ft. in the great rivers, and heavy rains are accompanied with abundant lightning and thunder. At Maranhao the annual rain-fall has been as high as 280 in., while at Rio Janeiro it is but 59 or 60 inches. Temperature is remarkably even, particularly in the Amazon basin. A record kept at Para between 1861 and 1867 showed the annual mean of 80° with extremes of 68° and 95°. The greatest ranges are in the central and southern tablelands and mountain ridges, where the coast temperature is hot and the air humid, while in the interior there may be snow and a little ice. The prevailing winds are the trades from the e., sweeping in the moisture of the Atlantic, and reaching inland along the whole valley of the Amazon to the Andes. These winds greatly mitigate the heat of the dry season. In the interior the course of winds is n. or s., blowing usually toward the sun. Along the ocean the usual interchanging land and sea breezes are of regular daily occurrence. Malarial fevers prevail in some of the low and marshy districts, but, as a whole, B is a healthy country. There have been epidemics of cholera and yellow-fever; but the ordinary mortality of cities and towns compares favorably with that of European cities.

Vegetation in B. is wonderfully prolific. Except on the loftiest mountains and in some stony districts, the country is luxuriant with vegetable life. In the mountain passes, near the sea-shore, the joint effect of heat and moisture produces a growth beyond man's efforts to restrain. Trees cut and split for fences send forth shoots and branches immediately, and this whether the position of the fragments be that in which they originally grew, or inverted. Along the Amazon the loftiest trees destroy each other in consequence of near proximity. In the province of Maranhao roots of grasses and other plants extending from the shores of pools weave themselves into vegetable bridges, along which the wanderer treads, unaware that he has left solid land until he

sees the jaws of a cayman protruding through the herbage beneath him. Along the coast mangroves are numerous and prominent, and so rank is their growth that the seeds begin to sprout before they drop from the parent stem, while the drooping branches strike into the soil and take root. Behind the mangroves come the palms in great variety, while the underwood is chiefly crotons. Brushwood and herbage are seldom seen; everything tends to the gigantic in size. The most varied forms group awkwardly together, crossed and intertwined with leaves. The preponderance of trecs with feathery foliage, and glossy, fleshy leaves, lends alternately a tender and luxuriant character to the scene, which in every other respect is painful from its monotony. Cocoa trecs, the vanilla, the cinnamon tree, various kinds of pepper, and Brazilian cassia are found. Above the falls of the large rivers the vegetation is generally different; and so is that of the southern pampas or prairies. There are found beautiful flowers, and at intervals groves of small trees growing far apart, while solitary myrtles, fruit trees, and occasionally a cactus add variety to the prospect. The cactus is prolific on the hot steeps of Pernambuco, and the medicinal ipecacuanha flourishes in Terro do Mar. In the valley of the Paraguay there is a profusion of water plants, in one river so many and so strong as seriously to obstruct navigation. The cocoa tree is in abundance near the sea-shore; Brazil-wood, noted for its dyes and its value as timber, also grows near the sea. Besides these there are the rosewood tree, the trumpet tree, the soap tree, the laurel-pear tree, and abundance of palms. The carnauba palm is one of the most useful trees; every part is valuable, even the wax yielded by its leaves being an article of commerce. More important still is the caoutchouc, or india rubber trce, the gum of which exported from B. annually amounts to more than $5,000,000. Thc banana tree furnishes the food of a great portion of the population. Other important fruits are the mango, pine-apple, custard-apple, guava, melons, and nuts.

Although not more than one acre in 200 in all B. is under cultivation, it ranks high as an agricultural country for some articles. The chief productions are coffee, sugar, cotton, manico or cassava flour, tobacco, rice, maize, fruits, and spices. Wheat and flour are imported from the United States; of the latter, '83, 618,908 barrels.

The varieties of animal life in B. are probably more numerous than in any other part of the globe. Of beasts of prey the jaguar, or South American tiger, is the most formidable; besides this animal there are the tiger cat, the puma, the ocelot, the red wolf, and the Brazil fox or wild dog. Large herds of peccary roam in the forests, where also are tapirs, largest of South American animals. The water hog, abundant on the river banks, is the largest rodent. Various species of deer inhabit the plains. Of edentata there are several species of armadillos, the ant-eater, and the sloth; and of marsupialia there are many kinds of the opossum family all over the country. Of monkeys the variety is surprising; the largest belong to the genus stentor, and are known as howling monkeys. The simia jacchus is found in no other region. There are many species of bats; while of birds the variety is wonderful, from the ouira, an eagle far larger and more powerful than the most important of European birds of prey, to humming-birds not larger than humble-bees. Among larger birds is the rhea, a species of ostrich. Most birds of B. are noted for beauty of plumage. Red, blue, and green parrots haunt the tree-tops; pigeons in great varieties throng the woods; orioles resort to the orange groves; chattering manakins mislead the sportsman; and the metallic tones of the uraponga resound through the forests like the strokes of a hammer on an anvil. The toucan is prized for its feathers, which are of lemon and bright red color, with transverse stripes reaching to the extremities of the wings. One beautiful specimen of the humming-bird has the native name of the "enanthe engera," or "winged flower." Serpents are found in great varieties, the most venomous being the rattlesnake and the jararaca. Others, such as the boa, attain enormous size. There are also many varieties of annoying insects along the rivers; one of them, the puim, so small as to be nearly invisible, inflicting a painful and sometimes dangerous bite. The red ant is a destroyer of vegetation, and large districts are sometimes laid waste by its ravages. Spiders attain enormous size, but few of them are venomous. Butterflies are innumerable, and of the most surprising beauty. A dozen varieties of wild bees, most of them honey-makers, have been noted. Caymans and lizards abound. The supply of turtle in the Amazon and its tributaries appears inexhaustible. The sea and the streams abound in fish, among which naturalists have within the past few years found many hundreds of kinds before unknown. One of the largest, the pira rucu, is the principal food of large numbers of people along the Para and the Amazon. The more important domestic animals are the horse, ox, and sheep. Immense numbers of wild horses roam the great southern prairies, found generally in droves of 20 or 30. Cattle also roam wild, and are killed in great numbers for their hides, horns, and tallow, which form a large proportion of the exports of the country.

The population of B. presents a number of distinct types, as well as many varieties blended therefrom. In the eastern or maritime provinces the aboriginal Indians have, to a great extent, become amalgamated with the settled population; but in the great forests and plains of the interior, they are nearly all in a savage condition. In general description the Indians are copper-colored, of medium height, thick-set, broad-chested, and muscular, with small hands and feet, and well-shaped limbs; hair black, thick, and straight; features broad, cheek-bones not generally prominent; eyes black,

SOUTH AMERICA

British Miles
0 100 200 300 400 500 600 700 800
Geographical Miles
0 100 200 300 400 500 600 700 800

Railways shown thus

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and sometimes oblique like those of the Chinese; in disposition apathetic and undemonstrative. Though considerably differing in different sections they appear to belong to one original stock, called the Tupi-Guavani. The only tribe that has almost entirely resisted the inroads of civilization is that of the Botocudos (q.v.), living in the forests of the Rio Doce, who are sunk in the lowest barbarism, and are fast dying out. From the mixture of the natives with Europeans, mainly with the Portuguese, are descended the Mamlucos, who first became prominent in raids and conquests in the southern provinces. Negroes, originally from Africa, form a large proportion of the population; and from these and whites have sprung mulattoes of all shades. The B. creoles, who call themselves Brazilerios, descendants of these mixed races, are little inferior in capacity, physical strength, or intelligence to the true Portuguese. A great social reform was begun by the law enacted in Sept., 1871, providing that after the date of the act all children born of slave parents should be free, and that all slaves belonging to the state or the emperor's household should likewise be free; and the same law set apart an emancipation fund to be applied to the ransom of slaves owned by private persons. Since that time emancipation has gone on rapidly, the work having been greatly assisted by private philanthropy, and by many of the slaveholders themselves. The importation of slaves was forbidden in 1853, and since then more than a million persons have obtained their freedom. The rapid progress of emancipation after 1871 caused some difficulty in the supply of labor; but the ultimate effect has been to give new avenues for the employment of capital, promote internal improvements, and induce desirable emigration from Europe. Enterprises of all kinds have multiplied, and public instruction has received a vigorous impulse. Until after 1872, when a full census was begun, every estimate of the population of B. had been based upon the official returns of 1817 and 18. In the first census the total was put at 4,396,000; in 1850, a round number, 7,000,000; and in 1860, 8,000,000. In the following table for 1876 the figures for the provinces marked * are estimated on the best available knowledge; those not marked are the census figures:

POPULATION.

Provinces.	Sq. Miles.	Free.	Slave.	Total.	Chief Towns.
Alto Amazonas	753,469	56,631	976	56,610*	Manáos.
Grão Pará	412,677	232,622	27,199	259,821	Para, or Belem.
Maranhão	141,651	284,101	74,939	359,040	S. Luis do Maranhão.
Piauhy	81,779	178,427	23,785	202,222	Therezina.
Ceará	50,262	689,773	31,913	721,686*	Fortaleza.
Rio Grande del Norte	20,130	220,959	13,020	233,979	Natal.
Parahyba	20,346	341,643	20,914	362,557	Parahyba.
Pernambuco	46,257	752,511	89,028	841,539*	Recife.
Alagōas	11,642	312,268	35,741	348,009*	Maceio.
Sergipe	12,038	139,812	21,495	161,307	Arácajú.
Bahia	204,803	1,120,846	162,295	1,283,141	Bahia.
Espiritu Santo	17,030	59,478	22,659	82,137*	Victoria.
Rio de Janeiro	18,490	456,850	270,726	727,576	Rio de Janeiro.
(Municipality of R. J.)	.....	226,033	48,939	274,972*	(City.)
São Paulo	90,541	680,742	156,612	837,354*	São Paulo.
Paraná	108,557	116,162	10,560	126,722*	Curitiba.
Sta. Catharina	18,924	144,818	14,984	159,802	Desterro.
Rio Grande do Sul	110,216	364,002	66,876	430,878	Porto-Alegre.
Minas Geraes	237,481	1,642,449	366,574	2,009,023	Ouro Preto.
Goyaz	263,373	149,743	10,652	160,395*	Goyaz.
Matto Grosso	668,655	53,758	6,667	60,417*	Curyabá.
Totals	3,288,110	8,223,620	1,476,567	9,700,187	

The constitution of B., dating from Mar. 25, 1824, establishes four powers in the state—the legislative, the executive, the judicial, and the moderating power, or royal prerogative. Senators are chosen for life at electoral meetings specially convened, each of which nominates three candidates, leaving the choice of them to the sovereign or his ministers. A senator must be of native birth, 40 years old, and must have an annual income of $800; there are 58 of them, and their salaries are $1800 per annum. Members of the house, or congress, are elected for four years. The empire is divided into electoral districts, in which every 30 voters select one elector, and the electors, varying in number according to population, nominate a deputy from each district. The house is composed of 122 members. A voter must have an income of (about) $112; an elector of $225, and a deputy of $450 per year. All registered voters must vote, or suffer a penalty. Minors, monks, and servants may not vote; and naturalized foreigners, and persons not of the state religion (Roman Catholic), are ineligible as deputies. The deputies have a salary of $1200 per annum, besides traveling expenses. Sessions are limited to four months. Each house chooses its own officers, and at the opening and closing of a session both houses sit in a general assembly for the disposal of important business. For ordinary purposes, they sit separately. Taxation, provision for the army and navy, and, if it should become necessary, the choice of a sovereign, originate in the house of

* There are probably 1,000,000 Indians not taken into account.

deputies. The senate deals with offenses committed by members of the imperial family, and by senators and deputies if committed during the session, and is invested with the right of convoking the legislative assembly should the emperor fail to do so for two months after the period fixed by law. The executive power is in the sovereign, assisted by the ministers and a council of state. The ministers are responsible for treason, corruption, abuse of power, and all acts contrary to the constitution, or the liberty, security, and property of citizens; a responsibility from which they cannot escape on the plea of orders from the sovereign. The executive functions consist in the convocation of the ordinary meetings of the legislative assembly; the nomination of bishops, governors of provinces, and magistrates; the declaration of peace or war, and the general execution and superintendence of all measures voted by the legislature. The moderating power, vested in the sovereign, gives him authority not only to select ministers and senators, but to temporarily withhold his sanction from legislative measures, to convoke extraordinary sessions of the legislative assemblies, to dissolve the chamber of deputies, and to grant amnesty and pardon. There are 7 ministries—war, foreign, interior, marine, finance, justice and public works, agriculture and commerce. The ministers are assisted by a council of state consisting of 12 ordinary and 12 extraordinary members, all named by the emperor, and holding office continuously. They are usually ex-ministers. The heir to the throne, if of age, is by right a councilor of state. At the head of each province is a president appointed by the general government; and each province has its local legislature, or provincial chamber, called the legislative assembly of the province. The members of the latter are nominated by the electors who choose deputies to the national assembly, but the members of the provincial chambers are chosen directly by the electors for two years. The power of these provincial bodies over local affairs is analogous to that of the general assembly over affairs of the empire.

The Roman Catholic is the established religion, but all others are tolerated "with the domestic or private forms of worship in buildings destined for the purpose, but without the exterior forms of temples." No one can be persecuted for religious acts or motives. The Roman Catholic clergy are maintained by the state; but funds are also voted for the assistance of other sects. No ecclesiastical decree can have force without permission of the emperor or of the general assembly. Marriages of Protestants celebrated in foreign countries are respected. The empire constitutes an ecclesiastical province of the Roman see, with an archbishop, 11 bishops, 12 vicars general, and about 1300 curates. Public education is in three distinct divisions—primary, secondary, and scientific. The first is gratuitous, and "will become compulsory as soon as the government considers it opportune." Thus far it is very backward.

The trade and commerce of B. have rapidly increased within the past decade. In 1884, there were 3500 m. of railroad open for traffic, and 1500 m. in course of construction. Telegraphs, though comparatively new, reported 4400 miles. There were at the close of 1882, 1610 post-offices, and 35,815,869 letters for the year. Weights and measures are those of the French metric system. The standard of value is the gold octava of 22 carats, equal to 4 milreis, or 4000 reis; value at the U. S. mint, $2.18.

BRAZIL′, a city in Clay co., Ind., on the St. Louis, Vandalia, Terre Haute, and Indianapolis railroad, 57 m. w.s.w. of Indianapolis; pop. '70, 2186; in '80, 3530. There are coal and iron mines near the place, and the people are largely engaged in mining and manufacturing. There are six churches, two banks, four weekly newspapers, and a number of good schools.

BRAZIL′, Island of, one of the mythical islands of the Atlantic set down by early cosmographers. The Arabic geography of Edrisi (middle of the 12th c.) describes several such islands, and in Mercator's atlas, 400 years later, the northern Atlantic (now known to be nearly clear of islands) is as full of islands as the sky is of stars. Among these mythical places were the isle of St. Brandon, said to have been discovered by the Irish in the 6th c., of which many wonders were told; the island of Anlilia; the island of the Seven Cities, said to have been the place of refuge of Christians flying from the Saracen conquerors of Spain; the island of Mayda, or Asmaide; and the isle Verde, behind which the inhabitants of the Hebrides imagine they see the sun disappear at setting. None, however, were more famous than the isle of Brazil, the name of which connects it with the red dye-wood of the same appellation. The island was assigned to several places, in one map being attached to the Azores, and finally getting the name of Terceira. The baseless tradition was not finally and officially exploded until the publication of the British admiralty charts of 1865.

BRAZIL CABBAGE, or Chou Caraïbe, (*caladium sagittifolium*, or *xanthosoma sagittifolia*), a plant of the natural order *araceæ*, nearly allied to cocco (q.v.), and very similar to it, although it differs in having arrow-shaped pointed leaves. It is supposed to be originally a native of tropical America, but is now in common cultivation throughout the whole tropics; not only the root being used for food like that of cocco, but also the leaves, boiled as greens. Both root and leaves are almost entirely destitute of the acridity so generally characteristic of the order.

BRAZILIAN GRASS, an incorrect popular name applied to a substance used in the manufacture of a very cheap kind of hats, knows as B. G. hats, and also as *chip* hats.

It consists of stripes of the leaves of a palm, *chamærops argentea*, which are imported into Britain for this manufacture, and chiefly from Cuba. See CHAMÆROPS.

BRAZILIAN PLUM. See HOG PLUM.

BRAZIL NUTS are the seeds of the *bertholletia excelsa*, a majestic and beautiful tree of the natural order *lecythidaceæ* (q.v.). The tree grows to the height of 100 or 120 ft., and abounds on the banks of the Orinoco and in the northern parts of Brazil. It produces a round woody pericarp or seed-vessel, almost as large as a man's head, within which are many of the seeds or nuts. The pericarp is very heavy and solid, requiring a blow of a sledge-hammer to break it; and at the time when this great fruit is ready to fall, it is dangerous to walk under the tree. The seeds, which are popularly called nuts, and much resemble fruits of that description, are wrinkled and triangular, having a hard shell and a pure white kernel, which, when fresh, is very agreeable. They are chiefly exported from Para and French Guiana, and are well known in our shops. They yield a large quantity of oil, which is good for burning. The nuts or seeds of the *lecythis ollaris*, or POT TREE, are produced in a pericarp which resembles a rusty iron pot with a lid, the lid dropping off and letting the seeds out, which are oblong, grooved, and esteemed of a very superior quality to the common B. N.; but they have not yet become an article of commerce, as the tree grows chiefly in the interior parts of the country, from which the nuts are only occasionally sent to the coast.

BRAZIL WOOD, a dark-red or yellowish-brown dye-wood, which forms a considerable article of export from Brazil, where some of the trees which yield it are very abundant. It is the produce of different species of *cæsalpinia* (q.v.). The best kinds are those called Pernambuco wood, all saints' wood, and St. Martha wood. Much of the B. W. of commerce is obtained from *cæsalpinia Brasiliensis*, a tree which is a native of the West Indies, commonly growing in dry places and among rocks, and seldom exceeding 30 ft. in height. It has bipinnate leaves, with many smooth, obtuse, oblong leaflets, and no terminal leaflets, the flowers in pannicles, with downy stalks. The heart-wood alone is of any value.—PERNAMBUCO WOOD is the produce of *cæsalpinia echinata*, a prickly tree, with prickly pods, and of which the red and yellow flowers have a delicious smell, resembling that of the lily of the valley. The sap-wood is extremely thick, and the valuable heart-wood bears a small proportion to the whole diameter of the stem. —The sappan wood (q.v.) of the East Indies nearly approaches B.W. in quality. It is the produce of *cæsalpinia sappan*, a small thorny tree.—The BRAZILETTO WOOD, sometimes also called B. W., which is brought from the Antilles, is much inferior. *Cæsalpinia crista* probably yields some of the inferior West Indian Brazil wood.—It is a curious circumstance, that B. W. is said not to take its name from Brazil, but to be mentioned under the name *Braxilis* in documents much older than the discovery of America, the sappan wood of the East Indies being probably intended, and the name of Brazil has even been supposed to be derived from that of this product of its soil.

When freshly cut, the color of B. W. is yellow; but when exposed to air, moisture, and light, it becomes red, and is generally sent into market ground down to the size of ordinary sawdust. When treated with water, alcohol, or ether, the weathered B. W. readily yields up its red coloring matter, called *Brazéléin*. The latter is supposed to be produced from the oxidation of a colorless substance called *Brazilin*, which exists in the original yellow wood of the tree. Strong decoctions of B. W. are used by the dyer and calico-printer in the fabrication of reds, browns, etc.; it is also used in the manufacture of red ink. See INK.

BRAZING, or BRASS SOLDERING, is the process of uniting together two pieces of brass, two pieces of copper, or one of each, by means of a hard solder, partaking more or less of the composition and properties of ordinary *brass*. The edges or parts of metal to be joined are first filed bright, so as to be thoroughly clean, then there is strewed over the gap or crevice a mixture of the solder and borax. The solder employed varies in composition according to the kind of work, and may be rendered more fusible by the addition of a larger amount of zinc, but the general proportions are (1) 16 copper, 16 zinc, and 1 tin; (2) 12 brass, 4 zinc, and 3 tin; or (3) 18 brass, 3 zinc, and 2 tin. When the whole has been fused together, it is allowed to cool, and is then filed down to a coarse powder, in which state it is used. The borax is employed to form a glaze over the brightened surfaces, and thus prevent the oxidation of the metal, which would seriously interfere with B., and even stop the operation. An outward coating or layer of charcoal is likewise serviceable in the exclusion of the air during the B. of large pieces of metal. Where a very high heat is required in the process, a little powdered glass is mixed with the borax. The mixture of solder and borax may be applied dry, but it is better to moisten it with water, and to lay it on the filed surfaces with a spoon. The whole is then gently heated, when the water evaporates and leaves a crust of borax and solder. The work may now be strongly heated before the blow-pipe, or over a clear fire, and at a bright red heat the solder fuses, and the zinc begins to burn with a pale-blue flame. At this stage, the solder *flushes* or becomes liquid enough to permeate the joint or crevice; but should it be tardy in acting thus, several slight taps will insure the proper result. The whole is now cooled, and, towards the close, the articles may be introduced into cold water for more rapid reduction in temperature. Pieces of metal which have undergone the process of

B. are so firmly united that they may be rolled and re-rolled without the parts yielding. See SOLDER.

BRAZORIA, a co. in s.e. Texas on the gulf of Mexico; 1260 sq.m.; pop. '80, 9780—7531 colored. The International and Great Northern railroads intersect the county. It has a level surface of oak forest and prairie. Agriculture is the main occupation. Co. seat, Brazoria, 48 m. s. of Houston.

BRAZOS, a co. in s.e. Texas, on the B. river; 578 sq.m.; pop. '80, 13,580—6257 colored. The surface is undulating and fertile; chief business, agriculture. The Houston and Texas railroad traverses the county. Co. seat, Bryan.

BRA'ZOS DE DI'OS, a river of Texas, North America, the second, if not the first, in magnitude that flows within the state. It runs towards the s.e., rising in the table-land of Bexar co., and falling into the gulf of Mexico about 40 m. to the s.w. of Galveston. With a course of about 900 m., it is navigable at all times to a distance of 40 m. from its mouth, and at certain seasons to a distance of 300 miles. The valley of the river, the lower half being merely an alluvial plain, presents extensive forests, interspersed with plantations of maize, sugar, and cotton.

BRA'ZOS DE SANTIA'GO, a port of entry in Cameron co., Texas, on the gulf of Mexico, 35 m. e.n.e. of Brownsville. It has some foreign and considerable coasting trade.

BRAZZA, an island in the Adriatic, belonging to Dalmatia, Austria, in lat. 43° to 44° n., and long. 16° to 17° east. It has an area of about 170 sq.m., and a pop. of 16,000; and is separated from the mainland by a channel of some 8 or 10 m. in breadth. Its surface is mountainous, and extensively wooded; vines, yielding excellent wine, are grown in the valleys, and figs, saffron, almonds, and oil are produced in considerable quantities, but not much grain is raised. Bees and silk-worms are reared in large numbers. B. is also celebrated for its cheese, and the delicacy of the flesh of its lambs and kids. Excellent building-stone, which is largely exported, is found in the e. part of the island. St. Pietro di Brazza is the chief town.

BREACH, in siege-works, is a gap in any of the defensive walls or gates of a city; and *breaching* is the operation by which the gap is produced by the guns of the besiegers. *Breaching batteries* are employed, consisting of several pieces of ordnance, so chosen as to kind and size, and so placed as to distance, as to burst a hole through the defenses in the shortest practicable time. The greatest effect is produced by lodging the balls in two vertical lines, from the parapet of the wall downwards, and in a horizontal line, connecting the lower ends of those vertical lines; and then overturning the mass of material thus loosened by an irresistible salvo or volley. When a hole has once been made, by thus knocking away the masonry or earthwork, the breaching is continued until the crumbling mass has so accumulated as to form a practicable slope, up which the storming-party of the besiegers may run. See ASSAULT. During the Peninsular war there were some formidable examples of breaching. At Badajoz, 14,000 shot brought down 180 ft. of wall in 104 hours, from a distance of 450 yards. At Ciudad Rodrigo, 6700 balls brought down 105 ft. of wall in 32 hours, from a distance of 560 yards. At St. Sebastian, 13,000 shot brought down 100 ft. of wall in 62 days, from a distance of 620 yards. It was calculated, from these and other instances, that 10,000 24-lb. shot, or 240,000 lbs. of iron, will breach 100 ft. of wall from a distance of 500 yards—the wall being of fair average masonry, and the height and thickness a fair average of those used in fortified towns. It must be remembered, however, that this estimate was made before the days of rifled cannon and Armstrong guns; and, on the other hand, that the walls adverted to were not constructed of granite.

***BREACH,** in law, signifies a breaking or violation of a right or of an obligation or engagement legally binding; and in this sense it has numerous applications, of which the following are those more particularly treated in law-books:

BREACH OF ARRESTMENT, in the practice of the Scotch law, is the disregard or violation of the process of arrestment, or attachment, by the arrestee, or party in possession of the arrested or attached property, but who, notwithstanding, pays the sums or delivers the goods arrested; and such B. is viewed by the courts as a contempt. But at present the only consequence of the B. is, that the person guilty of it, where it is a question as to *money*, is liable in damages to the extent of the funds paid away, and the costs. Where goods are arrested, and the arrestment is removed on bail (or "loosed on caution," as the Scotch lawyers say), if the goods themselves cannot be recovered, or their value cannot be clearly ascertained, the surety or "cautioner" is held to be liable for the original debt. See ARRESTMENT. In England, the disputing or disobeying a rule or order by a judge for attachment of a debt very nearly means the same thing. See ATTACHMENT, GARNISHEE

BREACH OF CLOSE is a trespass by which an unwarrantable entry is made on another man's land, for satisfaction of which injury an action will lie to recover damages. It is called a trespass for breaking a man's *close*, because every man's land is, in the eye of the law, inclosed and set apart from his neighbor's; and that either by a visible and

material fence, as one field is divided from another by a hedge; or by an invisible boundary, existing only in the contemplation of the law, as when one man's land adjoins to another's in the same field. The liability to this injury attaches not only to the party himself trespassing, but also to trespass by his cattle. And the law gives the party injured a double remedy in this case, by permitting him to distrain the cattle till the owner shall make satisfaction, or else by leaving him to the ordinary remedy by action for the damage done.

But in some cases this trespass is justifiable; as where it is done in exercise of a right of way, right of common, or the like; or where a man comes to demand or pay money payable on the particular land; or to execute, in a legal manner, the process of the law; or by the license of the plaintiff himself. Also, a man may justify entering into an inn or public-house without the leave of the owner first specially asked; because when a man professes the keeping of such an inn or public-house, he thereby gives a general license to any person to enter his doors. So a landlord may justify entering to distrain for rent; and a reversioner to see if any waste be committed on the estate, for the apparent necessity of the thing; and it has been held that the common law warrants the hunting of ravenous beasts of prey, as badgers and foxes, in another man's land, if no greater damage be done than is necessary, because the destroying such creatures is said to be profitable to the public. But in cases where a man misdemeans himself, or makes an ill use of the authority with which the law intrusts him, he is accounted a trespasser *ab initio;* as if one comes into a tavern, and will not go out in a reasonable time, but remains there all night, contrary to the inclinations of the owner; such wrongful act is held to affect and have relation back even to his first entry, and make the whole a trespass. But a bare nonfeasance, as not paying for the wine he calls for, will not make him a trespasser, for this is only a B. of contract. See Blackstone and Stephen's *Com.* respecting "civil injuries."

In the Scotch law, the term *close* is not used, and not known—but there any violation of a right of property in land may be redressed by legal process, and in many cases form the ground of an action for the recovery of damages. See CLOSE. The term *inclosure*, in Scotch law, has a different meaning, although the penalties for breaking such inclosure are somewhat analogous to those for breach of close. See below, BREAKING INCLOSURE, and see TRESPASS.

BREACH OF COVENANT is one of those civil injuries by which is meant a violation of a covenant or agreement contained in a deed of conveyance, either to do or omit to do something, and which B. gives a right of action against the party who made the covenant and his representatives. See COVENANT.

BREACH OF CONTRACT is a general description of injury, by which is understood the violation of any contract or legal engagement, and for which, at law, damages may be recovered, according to the nature of the breach and character of the contract. In 1854, jurisdiction was conferred upon the courts of common law, by which a plaintiff can compel a defendant to fulfill any actual duty. But till the constitution of the new high court of justice in 1873, it was only in the courts of equity that complete relief was given by enforcing the specific performance of contracts. See CONTRACT; DAMAGES; SPECIFIC PERFORMANCE; EQUITY, COURTS OF; CHANCERY, COURT OF.

In Scotland, although there is no distinction between law and equity, the remedy for this injury is very much the same. The party wronged may either conclude for damages, or *ad factum prestandum*, or for both these remedies.

BREACH OF DUTY may be legally defined as either the non-execution of an office, or the performance of it in such a way that the conditions on which it is undertaken are violated. Such misconduct may either violate the conditions of an express contract, or it may be equally opposed and do equal violence to any implied engagement or *assumpsit*, as it is technically called in the law of England, not from the express determination of any court or the positive directions of any statute, but from natural reason and the just construction of law, which assumes and intends that every man has engaged what his duty or justice requires at his hands. And he must do this with integrity, diligence, and skill; for if, by his neglect, injury accrues to individuals, they have their remedy against him in damages. See CONTRACT, DUTY, OBLIGATION, DAMAGES, EQUITY, PERFORMANCE OF CONTRACTS.

BREACH OF THE PEACE is an offense against the public tranquillity and safety, and is either felonious or not felonious. But the law on this subject will be best considered under PEACE, OFFENSES AGAINST THE PUBLIC.

BREACH OF POUND is an indictable offense, and means the breaking any *pound* (q.v.) or place where cattle or goods distrained are deposited, in order to rescue them. When once impounded, such goods or cattle are understood to be in the custody of the law, and an action for treble damages will lie for illegally taking them out of pound upon a distress for rent. Further, it is enacted by the 6 and 7 Vict. c. 30, that if any person shall release, or attempt to release, cattle lawfully seized by way of such distress, from the pound or place where they shall be impounded, or on the way to or from such pound or place, or shall destroy such pound—he shall be liable to a penalty not exceeding £5, and in default, may be committed to the house of correction. See Stephen's *Com.*, vol. iii., and see DISTRAIN, DISTRESS, POUND. See *Supp.*, page 877.

BREACH OF PROMISE TO MARRY. See PROMISE and MARRIAGE.

BREACH OF THE PEACE (*ante*), in general any riotous behavior, or annoying conduct, such as fighting, shouting, disturbing others assembled or singly, etc. In common practice almost any conduct that can be called "disorderly" is in some sense a B. of the P. Unless occasioning some serious revolt, a B. of the P. is only a misdemeanor.

BREACH OF TRUST. See TRUST.

***BREAD.** The earliest and most primitive way of making B. was to soak the grain in water, subject it to pressure, and then dry it by natural or artificial heat. An improvement upon this, was to pound or *bray* the grain in a mortar or between two flat stones, before moistening and heating, and from this *braying* operation some etymologists propose to derive the word *bread* (as if *brayed*). A rather more elaborate bruising or grinding of the grain leads to such simple forms of bread as the *oat-cakes* of Scotland, which are prepared by moistening oat-meal (coarsely bruised oats) with water containing some common salt, kneading with the hands upon a baking-board, rolling the mass into a thin sheet, and ultimately heating before a good fire, or on an iron plate, called a girdle, which is suspended above the fire. In a similar manner, the barley-meal and peas-meal *bannocks* of Scotland are prepared; and in the East Indies (especially the Punjab and Afghanistan), as well as in Scotland, flour is kneaded with water, and rolled into thin sheets, as *scones*. The *passover cakes* of the Israelites were also prepared in this way. A similar preparation of wheat-flour, but where the sheet of dough is made much thicker, forms the *dampers* of Australia. The Indian corn-meal, kneaded with water and fired, affords the *corn-bread* of America. The kinds of B. referred to above are designated *unleavened*, as no leaven has been added to the dough to excite fermentation. Even in the time of Moses, however, *leaven* was employed in making bread. It is held probable that the Egyptians were the first to use leaven; that the secret afterwards became known to the Greeks; and that the Greeks communicated the process to the Romans, who spread the invention far and wide in the northern countries during their campaigns.

The grain of wheat is generally employed in the manufacture of B. among the better classes and more advanced nations, though rye, barley, Indian corn, and rice are also extensively used. The average composition of the grain of wheat when dried, so as to evaporate about 14 per cent of moisture, is—

Gluten and albumen	13½
Starch	54½
Gum, sugar, oil, and fiber	30
Saline matter	2

The proportion of these ingredients varies, however; and though the native country of wheat is unknown, yet it is found that within the wheat zone (see WHEAT), the quality improves as we travel south. Thus, Scotch wheat is inferior to English, the latter to French, that to the Italian; and the finest wheat in the world is grown in Barbary and Egypt. The principal constituents of wheat may be separated from each other without much difficulty. Thus, if wheat-flour be placed in a cloth-bag with the mouth well closed, and the whole introduced into a basin of water, and pressed by the fingers for some time, the starch is squeezed through the cloth as a fine white powder, and the gluten is left in the cloth as a viscid or sticky substance. Again, if wheat-flour be burned on a porcelain plate on a fire, or oven, or gas-lamp, till it can burn no longer, it leaves behind a small amount of ash or saline matter.

Previous to being employed in the fabrication of B., the grain of wheat undergoes the process of *grinding*, with the double object of reducing it to a fine state of division, and separating the more hard and indigestible parts. See MILL. During the grinding operations, the wheat as it passes from grain to flour nearly doubles its bulk. The products come from the dressing-machine divided into different qualities, a quarter of wheat yielding—

	Bushels.	Pecks.
Fine flour	5	3
Second flour	0	2
Fine middlings	0	1
Coarse middlings	0	0½
Bran	3	0
Twentypenny	3	0
Pollard	2	0
	14	2½

In the making of B. in Great Britain, the finest flour is employed in making *firsts* or *the fine 4-lb. loaf;* a coarser flour is made into *seconds* or household B.; and a still coarser into *thirds* or coarse bread. There is no bran in *firsts*, but a greater or less proportion of the finer bran in *seconds* and *thirds*. In the making of good B. three things are absolutely requisite: flour or meal, yeast or leaven, and water containing salt. The yeast (q.v.), or leaven (q.v.), is added to give a start to the fermentation (q.v.) process, thereby supplying carbonic acid, which communicates a spongy or light texture to the bread. Leaven is the more primitive ferment, and is simply a portion of moistened

flour or dough in which the putrefactive agencies have begun to work. It may be procured by allowing moistened flour to lie in a warm apartment (summer heat) for six or eight days, and when sufficiently formed, has an acid taste and reaction, and a somewhat fusty odor. When brought in contact with a new portion of flour and water, and incorporated therewith by kneading, it very quickly acts as a ferment, and develops partial fermentation in the whole. Hence it is that where leaven is used, it is customary to retain a portion of the leavened dough for the next baking. On the continent, leaven is still very extensively employed, especially in districts far from breweries. In Britain, yeast is generally used as the ferment.

The materials being at hand, and the proper benches, utensils, and oven being within reach, the baker takes a quantity of water and adds to it the yeast and salt; after which the flour is added, and the whole thoroughly and laboriously kneaded together till it assumes a ropy consistence. It is then called the *sponge*, and is placed in a kneading-trough in a warm place, which is styled *setting the sponge*. In a short time, the yeast begins to act on the gluten, starch, and sugar of the flour, compelling the latter to pass into alcohol and carbonic acid gas in every part of the dough, which thereby becomes inflated with innumerable air cavities. When the fermentation has sufficiently advanced, the baker takes the sponge, adds more flour, water, and salt, and a second time subjects the whole to a thorough process of kneading, to prevent portions being so far fermented as to become *sad*, and again allows the mass to lie in a warm place for a few hours. The dough swells considerably from distension by gas, and is weighed out into lumps of the proper size, which are shaped into loaves, constituting the *batch*, or placed in tin pans, and are allowed to lie for a short time till they get further distended. The oven has previously been heated by flues, by heated air, or by wood being burned within it, to a temperature of at least 320° F., which is the lowest temperature at which B. can be baked, and ranging up to 572° F.; and when it has been thoroughly cleaned out, the loaves are introduced and placed on the floor, and the oven shut up. The heat acts in dissipating much of the water from the dough, in distending the air cavities more fully, and in partially *boiling* the starch and gluten of the dough, and developing some gum from the starch. Indeed, though the temperature of the oven is much higher, yet the loaves beyond the mere crust are bathed in an atmosphere of steam, and are never heated above 212°, as has been proved by direct experiments with the thermometer. One effect of the heat is to arrest any further fermentation (q.v.; see also Yeast). After several hours' baking in the oven, the length of time being determined by the temperature, the loaves are withdrawn, and allowed to cool. The brown appearance of the crust of loaves, and the pleasant taste of the crusts, are due to the action of the heat on the starch and the formation of dextrine (q.v.), a sort of gum. The number of quartern (4 lb.) loaves which a sack of flour weighing 280 lbs. yields, is 90. It will be apparent, therefore, that as 280 lbs. of flour yield 360 lbs. of B., that a good deal more water must be present in the latter than in the former; and indeed, ordinary good wheaten B. contains about 45 per cent of water. This water is retained even after the loaf is apparently dry, and even mealy, as the gum and gluten have a great affinity for water.

Improvements in the process of making B. are occasionally effected. Thus a form of yeast, called German barm or yeast (q.v.), has been introduced, which is more cleanly than ordinary yeast or leaven, but appears to be too rapid in its power of causing fermentation to be manipulated easily in the making of ordinary loaves, though it does well for pan-loaves and fancy B. in general. Ovens heated by flues are being constructed, instead of the primitive method of heating them by wood, which smokes the whole oven. Instead of raising the dough by the action of yeast, which decomposes a part of the flour and causes the loss of about 2 per cent, bicarbonate of soda and hydrochloric acid are sometimes employed. The proportion by this process are 4 lbs. of flour intimately mixed with 320 grains of bicarbonate of soda; to this is added a mixture of 300 grains of common salt in 35 ozs. of water and 6½ fluid drams of hydrochloric acid, sp.gr. 1.16, and the whole is kneaded and placed in the oven. When the mixture is made, the acid acts on the bicarbonate of soda, forming common salt, which is left in the dough, and carbonic acid is liberated at every point, and communicates a spongy texture to the dough. The disadvantage attendant on this mode of raising the dough is that it is apt to leave too much common salt in the bread. This is obviated by using water charged with carbonic acid, as described under Aerated Bread. Sesquicarbonate of ammonia is employed to some extent in the preparation of rusks, gingerbread, and other light fancy B.; when heated, it entirely passes into gas, and thus yields a very spongy mass. *Short-bread* is prepared from flour which has been incorporated with butter. See Unfermented Bread.

The appearance which good wheaten B. ought to present, is that of a vesicular or spongy mass, from which layers can be readily detached; and this, known to bakers as *piled B.*, is the best index of good wholesome and easily digested bread. When the layers cannot be detached, and the loaf cannot be crumbled down by the fingers into a coarse powder, or the fragments be thoroughly soaked and be readily diffused through water, but become a permanent tough mass of dough, the B. is imperfectly made.

Rye B. is very extensively used in northern European countries, where the soil being sandy is admirably adapted for the growth of that grain. It yields a flour darker than

wheat-flour. It is almost equal in nutritive value to wheaten bread. Barley and oats, which when used as B. are generally made into cakes or bannocks, possess also a composition not unlike wheat. Indian corn, which thrives luxuriantly on the American soil, and is largely used there for B., as also to a considerable extent in the old world, is little different from wheat in the proportion of its ingredients. Rice is occasionally employed in making B., but it is not nearly so nutritious as wheat.

But although, with the exception of rice, the various kinds of grain do not sensibly differ in the amount of nutritious matter contained in the meal, yet there is a great difference as to the quality of yielding a light, spongy bread. In this respect, the flour of wheat excels all others. This quality seems to depend upon the mechanical structure of the gluten of wheat, which gives a glutinous, sticky consistency to the dough, rendering it impervious to the carbonic acid gas formed in it during the fermentation, so that the gas thus imprisoned swells it up. The meal of other grains forms a more granular and less tenacious dough, which allows the gas to escape with more or less ease as it is formed. It is thus impossible to make a light, spongy loaf of oatmeal, however finely it might be ground. In the case of whole-meal B. or brown B., the rough, hard particles of the bran interfere with the ordinary tenacious quality of wheaten-flour, and make the dough slightly porous, so that much of the gas escapes, and thus this kind of B. is never so much raised as B. of fine flour.

Brown, Composition, or Whole Flour B. is made from the ground but undressed wheat, and therefore contains the bran as well as the flour. Some years ago it was suggested, that as the bran contained more nitrogenized matter than the flour, the whole meal must be more nutritious than the finer flour alone. But that opinion is now considerably modified; for while it is true that the whole meal (bran and fine flour) contains chemically more nutritive matter than the fine flour alone, yet the gritty particles that are present in the former, cause an unnatural irritation in the alimentary canal, and lead to a quicker evacuation of the but partially digested and absorbed food. This explains why brown B. possesses laxative properties, and why laborers fed on it consider that it makes them hungry soon again; they feel that it does not last in the stomach, and consequently think it has little nourishment in it.

The *adulterations* of B. are various. Very commonly boiled potatoes are added to the flour and water in the making of the dough, and some consider that this yields a lighter and more palatable bread. It must remembered, however, that the addition of any substance of a nature foreign to the composition of any material is an adulteration (see next article); and that though potatoes may be supposed to improve the B., yet good B. can be made without them, and the addition of the potatoes lessens the nutritive value of the wheat-flour. Alum is occasionally added to the dough, to increase the whiteness and improve the general texture of the B.; and this it appears to do by arresting the passage of the starch into gum and sugar, which tends to take place during the process of baking. In Belgium, sulphate of copper is often used for a similar purpose, but it is not employed in this country. All such admixtures are destructive of the nutritive value of a certain part of the B., and are injurious to the animal system. For the nutritive qualities of B. see Nutrition and Food, and for biscuit-bread, see Biscuit.

The *law* on the subject of bread, so far as relates to England and Scotland, is regulated by a local act for London, the 3 Geo. IV. c. 106, the provisions of which are imitated by a general act for the country, the 6 and 7 Will. IV. c. 37. These provisions are as follow: B. may be made of flour or meal of wheat, barley, rye, oats, buckwheat, Indian corn, pease, beans, rice, or potatoes, or any of them, or with any common salt, pure water, eggs, milk, barm, leaven, potato or other yeast, and mixed in such proportions as bakers may think fit, and with no other ingredient or matter whatsoever; and with the exception of French or fancy B. and rolls, the B. so made must be sold by weight, and in no other manner. It has been settled by many recent cases that bakers must weigh the bread before selling it, whether asked by the customer or not to do so. For this purpose, they must provide in their shops, on or near the counter, a beam and scales, with proper weights, or other sufficient balance, in order that the same may be weighed in the presence of purchasers—a regulation that also applies to delivery of B. by cart or other conveyance; it being directed that the scales and weights shall be constantly carried in the cart or other conveyance, under a penalty, in either case, not exceeding £5. From this regulation, however, fancy B., or French B., or rolls, are also excepted. The act further provides that B. made of mixed meal or flour—that is, B. made wholly or partially of pease, or beans, or potatoes, or of any sort of corn or grain other than wheat—shall be marked with the large Roman letter "M," under a penalty, in case this rule be neglected, of a sum not exceeding 10*s.* for every pound-weight of such mixed B. sold, and so on in proportion for any less quantity. From this regulation, however, is excepted B. made of the meal or flour of wheat, in the making of which potato-yeast shall be used.

The following are the enactments against the adulteration of B.: 1. No baker shall, in the making of B. for sale, use any mixture or ingredient whatsoever other than those above mentioned, under a penalty for every offense not exceeding £10, nor less than £5, with the alternative of imprisonment, with or without hard labor, for any time not exceeding six calendar months; and the offender's name, place of abode, and offense may be published in the local newspapers. 2. Any person adulterating corn-meal or

flour, by the introduction of any ingredient not being the real produce of the corn or grain; or any person selling meal or flour of one sort of corn or grain as the meal or flour of another sort, whether separate or mixed, shall forfeit and pay, according to the discretion of the magistrate or justice, a sum not exceeding £20, nor less than £5. 3. Magistrates or justices of the peace, and also peace-officers authorized by warrant, may, at seasonable times in the daytime, enter a baker's premises, and search for adulterated flour or B.; and if any be found, the same may be seized, and carried with all convenient speed to the nearest resident magistrate or justice of the peace, to be disposed of as he may think proper, the penalties varying from £2 to £10, with alternative imprisonment for six months; the offenders' names may also be published. Parties obstructing such search of bakers' premises, or upon the occasion of the search, carrying away the adulterated flour or B., are liable to a penalty not exceeding £10. Should it, however, appear that any offense against the act shall have been occasioned by the willful act or the neglect of the baker's journeyman or other servant, the magistrate may issue his warrant for bringing such servant before him, and, on conviction, may adjudge him to pay a reasonable sum to his master, by way of recompense. The adulteration of food act gives a more efficient mode of prosecuting these offenses, and exposing them, when detected.

The act further provides that bakers shall not bake bread, rolls, or cakes, on the Lord's day; or, on any part of that day, after half-past one o'clock in the afternoon, sell such bread, rolls, or cakes; or bake meat, pies, or other victuals; or in any other manner exercise the trade of a baker, save and except so far as may be necessary by way of preparation for the following day's baking. For a first offense against this regulation, a penalty of 10*s.* shall be paid; for a second offense, 20*s.*; and for a third and every subsequent offense, respectively, the penalty of 40*s.*, together with the costs of prosecution, a portion of the penalty to be paid to the prosecutor, and the residue to be applied towards the poor-rate of the place. This regulation as to Sundays does not extend to Scotland.

The law of Ireland on the subject of this article is contained in several acts of the Irish parliament, the leading provisions of which are similar to the above.
See *Supp.*, page 877.

BREAD, Army. In camps and in barracks of any size, the bread for the army is baked on the spot by bakers of the supply sub-department of control organization. Though perhaps a little rough in its manufacture, the article supplied is made from the best ingredients, and is genuine and wholesome. On a march, the control bakeries supply bread at the several halting-places. In smaller barracks, bread has to be obtained by contract, but the most vigorous supervision is exercised to secure proper quality. Formerly, army bread was notoriously bad. A contractor would sometimes send in a tender so low, in order to obtain the contract, that he could not possibly make good bread at a profit; and then he relied on small fees paid him by the soldiers as a means of obtaining better. This discreditable state of things was ascertained by a committee of inquiry some years ago; it was found that the average of army bread was not equal in quality to that of work-house bread. Steps were forthwith taken to remedy the evil; experiments were made to determine whether troops could bake their own bread in the field, and the result was the adoption of the present system of army baking. With the improvement of the bread, a visible amelioration in the health of the soldiers has taken place.

BREAD-FRUIT TREE, *Artocarpus incisa*, a tree of the natural order *artocarpaceæ* (q.v.), a native of the islands of the Pacific ocean and of the Indian archipelago—one of the most important gifts of nature to the inhabitants of these regions, its fruit supplying the principal part of their food, and its inner bark a considerable part of their clothing, whilst its timber and its milky juice are also employed for economical purposes. The genus to which it belongs (*artocarpus*, Gr., bread-fruit) is distinguished by having the male flowers in catkins, with a 2-leaved perianth and one stamen; the female flowers naked; the fruit roundish, fleshy, and tuberculated. The bread tree is a rather slender tree, of 40 to 50 ft. high, often rising almost half its height without a branch. It has large, pinnatifid leaves, frequently 12 to 18 in. long, dark green, and glossy. The fruit is generally oval, or nearly spherical, and about the size of a child's head. It is a *sorosis*, a compound or aggregate fruit formed from numerous flowers on a common axis, and is covered with a roughish rind, which is marked with small square or lozenge-shaped divisions, having each a small elevation in the center; is at first green; when imperfectly ripened, brown; and when fully ripe, assumes a rich yellow hue. It is attached to the small branches of the tree by a short thick stalk, and hangs either singly or in clusters of two or three together. It contains a somewhat fibrous pulp, which, when ripe, becomes juicy and yellow, but has then a rotten taste. At an earlier stage, when the fruit is gathered for use, the pulp is white and mealy, and of a consistance resembling that of new bread. In a still less mature state, the fruit contains a tenacious white milk. The common practice in the South Sea islands is to cut each fruit into three or four pieces, and take out the core; then to place heated stones in the bottom of a hole dug in the earth; to cover them with green leaves, and upon this to place a layer of the fruit, then stones, leaves, and fruit alternately, till the hole is nearly filled, when leaves and earth to the depth of several inches are spread over all. In rather more than half an hour, the bread-fruit is

ready; "the outsides are, in general, nicely browned, and the inner part presents a white or yellowish cellular pulpy substance, in appearance slightly resembling the crumb of a wheaten loaf." It has little taste, but is frequently sweetish, and more resembles the plantain than bread made of wheat-flour. It is slightly astringent, and highly nutritious. Sometimes the inhabitants of a district join to make a prodigious oven—a pit 20 or 30 ft. in circumference, the stones in which are heated by wood burned in it, and many hundred bread-fruits are thrown in, and cooked at once. Baked in this manner, bread-fruit will keep good for several weeks. Another mode of preserving it is by subjecting it in heaps to a slight degree of fermentation, and beating it into a kind of paste, which, although rather sour, is much used when fresh bread-fruit cannot be obtained. There are numerous varieties of the bread tree in the South Sea islands, and they ripen at different seasons. The tree produces two, and sometimes three, crops a year. In the West Indies and South America, into which it has also been introduced, the bread-fruit has not come much into use as an ordinary article of food; but various preparations of it are reckoned delicacies.—The fibrous inner bark of young bread-fruit trees, beaten and prepared, is used for making a kind of cloth, which is much worn by the common people in the South Sea islands, though inferior in softness and whiteness to that made from the paper mulberry (see MULBERRY, PAPER).—There exudes from the bark of the bread tree, when punctured, a thick mucilaginous fluid, which hardens by exposure to the air, and is used, when boiled with cocoa-nut oil, for making the seams of canoes, pails, etc., water-tight, and as bird-lime.—The timber is soft and light, of a rich yellow color, and assumes, when exposed to air, the appearance of mahogany. It is used for canoes, house-building, furniture, and many other purposes. It is durable when not exposed to the weather.—The JACK (q.v.) or Jaca (*A. integrifolia*), and the DEPHAL (*A. lakoocha*), both large East Indian trees, belong to the same genus with the bread-fruit tree.

BREAD-NUT, the fruit of *brosimum alicastrum,* a tree of the natural order *artocarpaceæ,* and therefore allied to the bread-fruit, a native of Jamaica. The genus *brosimum* is distinguished by male and female flowers on separate trees, in globose catkins, with peltate (shield-like) scales for perianth, and the fruit a one-seeded drupe. The bread-nut tree has ovate-lanceolate evergreen leaves; it abounds in a tenacious gummy milk. Its leaves and young shoots are much eaten by cattle, but deleterious qualities are developed in them as they become old. The nuts, boiled or roasted, form an agreeable article of food, and are eaten instead of bread. Their taste resembles that of hazel-nuts.—To this genus the *palo de vaca,* or COW TREE (q.v.), of Demerara is supposed also to belong.

BREAD-ROOM. In the navy, the biscuits are called *bread,* and the place where they are stored is the bread-room; it is carefully constructed, warmed before being filled, and kept as much as possible free from damp.

BREAD-ROOT. See PSORALEA.

BREADTH, in art, is a term which, though often used in a very indefinite manner, is not without a definite meaning. It signifies that peculiar disposal of the background of a picture which, without sacrificing or even concealing details, gives to the whole unity and harmony of effect. With the older landscape-painters, it was a common fault to produce the effect of distance either by a certain trick of light and shadow, or by one uniform hazy color in which the individual objects were entirely lost to view, and *breadth became vacancy.* In this respect, their pictures contrast unfavorably with those of such modern painters as Turner, of whom Mr. Ruskin has very truly said that "the conception of every individual inch of distance is absolutely clear and complete in the master's mind—a separate picture fully worked out: but yet, clearly and fully as the idea is formed, just so much of it is given, and no more, as nature would have allowed us to feel or see; just so much as would enable a spectator of experience and knowledge to understand almost every minute fragment of separate detail, but appears to the unpracticed and careless eye just what a distance of nature's own would appear—an unintelligible mass. Not one line out of the millions there is without meaning, yet there is not one which is not affected and disguised by the dazzle and indecision of distance. No form is made out, and yet no form is unknown." On the subject of breadth Mr. Ruskin has, moreover, the following very judicious remarks: "It were to be wished that our writers on art would not dwell so frequently on the necessity of breadth, without explaining what it means, and that we had more constant reference made to the principle, which I can only remember having seen once clearly explained and insisted on—that breadth is not vacancy. Generalization is unity, not destruction of parts; and composition is not annihilation, but arrangement of materials. The breadth which unites the truths of nature with her harmonies is meritorious and beautiful, but the breadth which annihilates those truths by the million is not painting nature, but painting over her; and so the masses which result from right concords and relations of details are sublime and impressive, but the masses which result from the eclipse of details are contemptible and painful."

BREAD-TREE. See CAFFER BREAD.

BREAKERS, in maritime language, are the waves that break violently over rocks lying a short distance under the surface of the sea. They cover that particular part of

the sea with a foam, and produce a hoarse and often terrible roaring. "Breakers ahead" is one of the most alarming announcements made by the lookout men of a ship, seeing that the B. denote the existence of sunken rocks which may, perchance, pierce the hull of the vessel.

BREAKING BULK, in the Scotch law, signifies making use of an article supplied in bulk, or in quantity; by which act one is said to break bulk, and is, in consequence, prevented from afterwards objecting to it, and returning it to the seller. See SALE OF GOODS.

BREAKING INCLOSURES is an expression to be found in Scotch law-books, and means the destruction or invasion of planting and inclosures by persons or their cattle. The punishment for this offense is provided for by several old Scotch statutes, the principal of which are two passed in 1661 and 1685 respectively, The penalties are pecuniary, with right to detain the cattle found trespassing, until such penalties, along with the damage and costs, are paid. See PLANTATION.

BREAKWATER is a barrier intended for the protection of shipping in harbors or anchorages. It sometimes happens that, in front of a semicircular bay, a small island is so situated as to form a natural breakwater. This is to some extent the case with the isle of Wight, which occupies such a position as to protect Portsmouth and Southampton from the south. In many other places, however, bays and harbors are without such screens. A pier may be so placed and constructed as to serve also the purpose of a B., but the term B. is generally confined to a structure used solely for protection, and not for berthage or traffic, and breakwaters are frequently insulated, so as to be cut off from any communication with the shore unless by water.

Plymouth B. is the best known of these engineering works. The sound or harbor, being open to the s., was so much exposed to storms that, early in the present century, it was determined to construct a B. across its mouth, with openings between it and the shore, on either side, for the ingress and egress of shipping. The works were commenced in 1812. The operations consisted in transporting along a tram-road large blocks of limestone got from a neighboring quarry, shipping them in vessels fitted with trap-doors, and by means of these depositing them in the shape of a huge mound in the required situation. As soon as the stones began to appear above water, a perceptible benefit resulted in the relative calmness of the sound during the prevalence of storms; but the structure was frequently very roughly handled by the waves, which altered and flattened its shape. A severe storm in Nov., 1824, threw a great portion of the stones over into the sound. It was not until 1841 that the works were finally completed, by the deposition of more than 3,000,000 tons of stone, and the expenditure of nearly £1,500,000. The B. is nearly a mile long, the central portion is 1000 yards; and two wings, of 350 yards each, extend from the ends of this at a slight angle. The open channels at each end, between the B. and the shore, are each about half a mile wide, and their depth is respectively 40 and 22 ft., at low water. The B. is 133 yards wide at the base, and 15 at the top—the two sides being made very sloping for the security of the stones. The slopes and top are faced with masonry. The water-space protected by this B. comprises 1120 acres, and it is generally admitted that the money has been well spent on the work.

Holyhead B. is formed of stone quarried in Holyhead mountain, drawn along a tramway on a timber structure, and cast into the sea. It more resembles a pier than the B. at Plymouth, for it is attached at one end to the shore, and is intended to convert Holyhead bay or roadstead into a harbor of refuge. The works consist of a mound of loose stones up to low water, and ashlar upright walls with a parapet above that line, with a railway on the top for trains.

Portland B. is of very great value, in converting into a harbor of refuge the expanse of water between the Dorsetshire coast and the isle, or rather peninsula of Portland. An act of parliament was obtained in 1847, authorizing the works. The B., starting from the n.e. point to the isle, stretches nearly due n. for more than 2 m., with one or two intervening openings for the ingress and egress of shipping. The works were conducted more easily than those of any other great B.; for the isle contains an abundance of stone easily quarried, and the steep shores afforded facility for transporting the stones by their own gravity to their destination. The work—which is an upright ashlar superstructure, with a parapet founded on a mound of rubble stones—was done chiefly by convict labor; the depth is about 50 ft. at low-water. From the nature of the operation, any part of the B. became useful as soon as constructed, increasing the safety of Portland bay as a harbor of refuge.

Dover B. progresses slowly, and has involved an enormous outlay. There is no stone near to form a mound, as in the other breakwaters spoken of, and, in consequence, the work requires to be brought up in soild ashlar from the bottom by the diving-bell, with the interior formed of blocks of concrete. It has never been clearly stated whether the government regards this B. as a protection to a great naval station and fortified harbor, or as a chief feature as a harbor of refuge for commercial fleets. In 1844, a commission of inquiry recommended that £2,500,000 should be laid out in forming a harbor of refuge at this place. In 30 years the work has not been finished, the great depth and frequent storms constituting terrible obstacles. The water is very deep—viz., 42 ft. at low-water; the

accumulations of shingle very troublesome; and several years must elapse before it can be made evident whether the Dover B. is worth the national money expended upon it.

Alderney B. is a great work, consisting of ashlar walls and parapet, built on a stone mound up to low-water from a depth of 72 feet. Small breakwaters have been constructed at Cette near Marseilles, at the mouth of the Delaware in the United States, and at Buffalo in lake Erie; but they do not call for description.

Cherbourg B. is the greatest and the most costly ever constructed. Nearly 100 years ago, M. de Cessart proposed to the French government the formation of a B. at Cherbourg, to be commenced by the construction of a number of hollow cones formed of timber-framing, sunk in a line as close as they could be placed to each other, and then filled with stones. These cones, of which there were to be 64, each about 70 ft. high, 150 ft. in diameter at the base, and 60 ft. at the top, were intended to form a nucleus to the stone breakwater, to prevent the stones, during its formation, being knocked about and too much spread out by the action of the waves. In 1784 to 1788, 16 cones were constructed, and 13 of them sunk; but so great was the destruction which they underwent during stormy weather, that the government at length abandoned the plan, and carried on the stone breakwater without the aid of the cones. It was completed under Napoleon III. at a cost exceeding £2,500,000. The B. itself was finished in 1853, but since that year large fortifications have been built upon the upper works. The length is nearly 2½ m.; the B. is 300 ft. wide at the bottom, and 31 at the top. The chief mass consists of rubble or unshaped stones, thrown down from ships; but there is a larger ratio of wrought and finished masonry than in the Plymouth B., consisting of granite blocks imbedded in cement. The depth of water is about 60 ft. at low-water spring-tides; and the B. rises to 12 ft. above high-water level. The water-space included within and protected by the B., is about 2000 acres, but two thirds of this has scarcely depth enough for the largest-sized ships. The relation which this B. bears to the vast military and naval arrangements of the place will be noticed under CHERBOURG.

Many substitutes have been proposed for solid breakwaters, such as floating breakwaters constructed of timber framework, open iron screens, etc., but none of them have been shown to be suitable for actual practice. Close timber-work, filled in with stones, is found to be quite efficacious; but on most of our coasts the timber is liable to be eaten by the marine worm, which is an almost insuperable objection to its being used under water.

BREAKWATER (*ante*). In the United States the most important work of the kind is at Lewes, Del., at the entrance of Delaware bay. A breakwater was resolved upon in 1828, and the next year the site was fixed at cape Henlopen. In 1870, the engineer reported the completion of the harbor "according to the original project devised more than 40 years ago." In the year after the completion, more than 20,000 vessels visited the harbor, and since its first use in 1833, about 300,000 vessels of all sorts have sought shelter or trade behind the Delaware breakwater. A recent report says: "Let a threatening sky foretell the approaching storm, and a few hours will suffice to fill a previously vacant harbor. Let a north-easterly storm continue a day or two with severity, and the harbor becomes crowded entirely beyond its capacity." Its present capacity is determined by the space that is sheltered by the B. proper. This is a straight line nearly half a mile long, and may be taken as the diameter of a half circle behind it, the area of which will represent approximately the sheltered harbor. North-east of the B. is the ice-breaker structure, a quarter of a mile in length, with an opening of about the same extent, through which the sea rolls without hindrance. Within the past five or six years this important work has been much extended and improved. It is altogether of stone, in rubble-wall and more finished work. There are finished or in construction several B.'s in the northern lakes, for the most part made of timber cribs filled with stone.

BREAM, a name which is apt to occasion some confusion to beginners in ichthyology, being applied equally to certain fresh-water fishes of the family *cyprinidæ* (q.v.), and to certain sea-fishes of the families *sparidæ* (q.v.) and *chætodontidæ* (q.v.) or *squamipennes*, among which the resemblance is a mere general one of outward form, the first of these families belonging to the order of *malacopterous*, or soft-finned, the other two to that of *acanthopterous*, or spiny-finned fishes.

The breams of the family *cyprinidæ* were included in the genus *cyprinus* (see CARP) by the older naturalists, but are readily distinguished from that genus as now defined, and from other allied genera, by their deep and compressed form, by the great convexity of both the dorsal and the abdominal outline, by the want of spiny rays in the dorsal and anal fins, by the great length of the base of the anal fin, and by the want of cirri or barbules at the mouth. They form the genus *Abramis* of Cuvier.—The COMMON B., or CARP B. (*A. brama*), is an inhabitant of many rivers and lakes of Europe, even as far n. as Norway and Sweden, and of some of those of Britain and Ireland. It thrives best in still waters, and in some of the Irish lakes attains a large size; it has been known to reach 12 or even 14 lbs. The tail is very broad and much forked, the head small and acuminated, the eyes very large, the scales small, the general color yellowish-brown, the cheeks and gill-covers silvery-white.—The WHITE B., or BREAMFLAT (*A. blicca*), differs from the common B. in its silvery color, the smaller number of rays in the pectoral and anal fins, and other particulars. It has never been taken of so large a size. It is

found in many parts of the continent of Europe, and in some of the British lakes and rivers.—The POMERANIAN B. (*A. buggenhagii*) differs much more widely from the common B.; the body is much thicker in proportion to its depth, the scales larger, the base of the anal fin shorter, the tail less forked. This fish is known to occur in a few places of England and Ireland, and is said to abound in Pomerania.

The acanthopterous breams, or SEA BREAMS, are mostly of the family *sparidæ*, and nearly allied to the gilthead (q.v.), in connection with which they may most properly be noticed. The common sea B., indeed, often receives the name of gilthead. Only one of the British sea fishes called B., the *brama raii* already noticed (see BRAMA), belongs to the family *chætodontidæ*.

Angling for Bream.—Of the two kinds of B. known to anglers, the carp B. is much the best for sport. The flesh of the B. is not held in much estimation, though the carp B. is infinitely to be preferred of the two. B. are found in both ponds and rivers. They prefer deep, still holes, or quiet, well-sheltered eddies in the bends of rivers. Here the angler will find them in large numbers. They are rather capricious in feeding; at times they will not bite for weeks together. Being a sly, shy-biting fish, the tackle required for them must be fine. They may be taken by means of the ledger (q.v.) in rivers, where they should be fished for in the same way as directed for barbel, save that it will be found advisable to use another hook, which should be fastened on to the line about 8 in. or a foot above the ledger lead, as B. often take their bait some inches off the bottom. The hooks should be No. 7. In float-fishing for B. in holes or eddies, a stout swan-quill float and half a dozen No. 1 shot below it, will be found sufficient for the purpose; and, having ground-baited as directed for barbel, put on two small red worms for the angling bait, or about an inch of the tail of a bright, well-scoured lob-worm. The former is preferable. Two hooks, one to rest on the bottom, and one 6 or 8 in. off it, will be found useful, for sometimes one will be taken, and sometimes the other. The fish being tender-mouthed, should be played gently. After the first rush, a B. soon tires, for his form is not fitted or shaped for a prolonged resistance. The B. has an unpleasant practice of bowing downwards and rubbing the line with his tail, and the line often comes up covered with a thick slime from his body, for a foot or more above the hook. It is needless to remark that this must be cleared off before the tackle is again used. The rod should be a light cane-rod, moderately stiff, and some 12 or 13 ft. long for float-fishing for B. from a boat or punt. Of all baits, worm is decidedly the best. Some recommend bullock's blood and grains to ground bait with, but worms are found to answer all purposes. B. spawn about the end of May, choosing the most weedy spots for that purpose; and after scouring and cleansing in some gentle gravelly stream for a week or two, they return to the deep still holes again. A clay or sandy bottom is preferred to any other. The presence of B. may always be detected by their fondness for coming at times to the top of the water, or, as anglers term it, "priming." Early in the morning, or late in the evening, the whereabouts of B. may always be discovered by their rising then. In Lough Erne the shoals are prodigious, and cause a ripple on the water like a stiff breeze of wind.

BREAMING, in nautical affairs, is a cleansing process which a ship undergoes after a voyage, or after lying for a long time in harbor. The ship's bottom, under such circumstances, often becomes covered with grass, ooze, shells, or sea-weed; and B. consists in the removal of these impurities. The ship is laid aground after the tide has ebbed, or is docked, or is careened (see CAREENING); furze and fagots are placed under it; fire is applied; the heat melts the pitch, etc., of the hull, and the pitch and filth can then be scraped and brushed off.

BREAST, THE FEMALE, or mammary gland, consists of a series of tubes, radiating from a common center, the nipple, which is situated in an areola or dark-colored patch. On the surface of the latter are several (from 4 to 10) sebaceous glands, which secrete an unctuous fluid to protect the skin of the nipple, which is very thin, from the saliva of the sucking infant. The milk-*tubes* (15 to 18 in number) enlarge into *sinuses*, and pass each to a separate lobe or subdivision of the breast, where they divide into twigs and branches (the *lactiferous ducts*), which end in minute vesicles. The lobes are held together by fibrous tissue, and are well packed in fat, which increases sometimes to an enormous extent the apparent size of the organ. It will be readily understood how over-distension of these delicate tubes, from whatever cause, must be productive of great suffering. When an abscess forms in the B., it is very dangerous to allow the matter to remain; but when an opening is made into an abscess of the B., the cut must be made in some line radiating from the nipple, so as to avoid division of the milk-tubes.

BREASTPLATE, in ancient armor, was a plate of iron, steel, or other metal, so fastened as to protect the chest or front of the wearer. The back-plate, in like manner, was worn to protect him from attack from behind. In modern European armies, almost the only representative of the B. is the front half of the *cuirass*, worn by the *cuirassiers* in certain foreign states, and by the household cavalry (life-guards and horse-guards) in England.

BREAST-SUMMER, BRESSUMER (Fr. *sommier*, a lintel), a beam supporting the whole front of a building, in the same way in which a lintel supports the portion over an

opening. They are seen in England and on the continent in old houses that are built partly of wood and partly of stone, brick, or mud.

BREAST WHEEL. See WATER POWER, *ante.*

BREASTWORK, in fortification, is a hastily constructed earthwork; not so high as to need a *banquette* (q.v.) for the defenders to stand upon, but sufficient to afford shelter when they are standing on the level of the ground, and firing over the crest. The dry ditch or trench from which the earth has been taken to form the B., affords an additional defense. A B. is midway between a *parapet* and an *épaulement,* in size and importance.

BREATH, OFFENSIVE, may depend upon some cause limited to the mouth or nose, or it may arise from diseased conditions of the respiratory or digestive apparatus. If, from want of proper attention, the teeth have collected a quantity of putrescent particles around them, they must be well scrubbed with a brush and tepid water, with some powdered carbonate of magnesia mixed with it. A wash composed of a teaspoonful of tincture of myrrh in a pint of water is also very useful. Occasionally the secretion from the tonsils (q.v.) is very offensive; and then a solution of nitrate of silver, 4 grains to 1 ounce of water, should be applied to them every morning, with a camel-hair brush, and small alterative doses of medicine administered. Solutions of soda in water are also very useful. Should the fetid smell arise from a portion of dead bone, the latter must be removed whenever it becomes loose. Inhalations of steam from hot water into which some creasote has been dropped, is much recommended for cases in which the cause resides in the nose and respiratory passages. When, however, it is caused by digestive derangements, the treatment should consist in purging, to empty the intestinal canal, followed by soda, to correct acidity, and tonics, of which the bitter infusions and tinctures, and the dilute mineral acids, are among the best.

All medical treatment is unavailing to correct the foul odor which rises from the stomach of the habitual drunkard, or from the victim of gangrene or abscess in the lungs.

BREATH AND BREATHING. See RESPIRATION.

BREATH FIGURES. See COHESION FIGURES, *ante.*

BREATHITT, a co. in e. Kentucky; 600 sq.m.; pop. '70, 5652—181 colored; in '80, 7742. The co. is hilly, with forests, and has iron and coal; but the main productions are agricultural. Co. seat, Jackson.

BREBEUF, JEAN DE, b. France, 1593; killed in the Huron country in 1649; a Jesuit missionary who came with Champlain in 1626. His labors were mainly among the Hurons, with whose life and language he became very familiar. When the town of St. Louis was taken by the Iroquois, B. and Lalemont, his associate, were made prisoners and tortured to death. It is said that B.'s head is preserved in the pediment of a silver bust in the convent of the hospital nuns in Quebec. Some of his writings on the Huron language are preserved, and were translated by Albert Gallatin.

BRECCIA, a term adopted from the Italian to designate a mass composed of angular fragments of rocks of the same or more different kinds, cemented together by an enveloping paste, or by infiltrated iron or carbonate of lime.

BRECHE-DE-ROLAND, a defile of the Pyrenees, between France and Spain, about 11 m. s. of St. Jean de Luz, with an elevation of about 9500 ft. above the sea. It is a difficult passage of from 200 to 300 ft. in width, between precipitous rocks rising to a height of from 300 to 600 feet.

BRE'CHIN, a t. of Forfarshire, on the left bank of the South Esk, 8 m. w. of its junction with the sea at Montrose. Pop. '81, 9031. It unites with Montrose, Arbroath, Forfar, and Bervie in returning one member to parliament. Spinning, bleaching, distilling, and brewing are carried on here, as also the manufacture of linens and sailcloth. B. was once a walled town, and contained an abbey of Culdees, instituted, it would seem, about the end of the 10th century. David I. founded a cathedral and bishopric here in the 12th century. Part of the cathedral, built chiefly in the 13th, 14th, and 15th centuries, is now the parish church. Close to the church is a round tower, similar to the Irish ones and to the one at Abernethy, the only other example in Scotland. The tower is 85 ft. high, 25 ft. in diameter at the base, and 12½ ft. at the top, and it is surmounted by a 15th c. spire of 25 feet. B. castle, the ancient seat of the Maules (now of their representative, the earl of Dalhousie), was taken by Edward I. in 1303, after a siege of 20 days. B. was burned by Montrose in 1645; and near it, Huntly, on the part of James II., defeated the Crawfords in 1452. Gillies, the historian of Greece; Maitland, the topographer; and Dr. Guthrie, the famous Scotch preacher, were natives of Brechin.

BRECKENRIDGE, a co. in n.w. Kentucky, on the Ohio river, 450 sq.m.; pop. '80, 17,486—2204 colored; undulating surface, well watered and fertile. There are some curious sink-holes and caves in the co.; and there are various medicinal springs. Chief productions, agricultural. Co. seat, Hardinsburg,

BRECKENRIDGE, a village in Wilkin co., Minn., on the Red River of the north; the terminus of the St. Paul and Pacific railroad. 217 m. w.n.w. of St. Paul. Steamers pass down the river to Manitoba. Pop. '80, 436.

BRECKENRIDGE, John, D.D., 1797–1841; b. Ky.; a Presbyterian minister, graduate of Princeton college. In 1822 he was licensed to preach, and soon afterwards served as chaplain in congress. His first church was in Lexington, Ky., where he established a newspaper, *The Western Luminary.* In 1831 he removed to Philadelphia and was secretary and general agent of the Presbyterian board of education; subsequently professor in Princeton theological seminary; and in 1838 secretary and general agent of the board of foreign missions. He resigned in 1840, and just before his death was chosen president of Oglethorpe university, in Georgia.

BRECKENRIDGE, John Cabell, b. Ky., 1821; studied law in Transylvanian university, and settled at Lexington. He was a member of congress from his state for several terms; and in 1856 was elected vice-president. In 1860 he was nominated for president by the extreme southern section of the Democratic national convention, but, with Douglas and Bell, was defeated by Lincoln. He was immediately chosen U. S. senator, but abandoned his seat and went with the secessionists, where he entered the army and became a maj.gen. In 1865, just before the collapse of the rebellion, he was appointed confederate secretary of war. At the close of the conflict he went to Europe, where he remained several years. He died in 1875.

BRECKENRIDGE, Robert Jefferson, D.D., brother of Rev. John, 1800–71; b. Ky.; at first a lawyer and member of the legislature; but in 1829 he joined the Presbyterian church, and in 1832 became pastor of the first Presbyterian church in Baltimore, where he officiated for 13 years. In 1845, he became president of Jefferson college; two years later removed to Kentucky and became state superintendent of public instruction. In 1853, he was professor of theology in Danville seminary. Dr. B. was a strong old-school leader in the great division of the Presbyterian church. In the slavery discussions he was extreme on neither side, and when the civil war began he was for the union, but he was much opposed to the emancipation proclamation. In 1864, he was president of the convention that nominated Lincoln for a second term. Dr. B. is credited with being the principal author of the common school system of Kentucky. Among his works are *Internal Evidences of Christianity; Papism in the United States;* and some books of travel.

BRECK'NOCKSHIRE, or Bre'con, an inland co. of South Wales, to the s. of Radnor, from which it is separated by the Wye. Length, about 35 m.; average breadth, 20. Area, 719 sq.m., of which two thirds are cultivated. B. is one of the most mountainous counties in South Wales, and has deep, beautiful, and fertile valleys. Two principal mountain-chains, the highest in South Wales, rising with Brecknock peaks to a height of 2862 ft., intersect the county in the n. and s., and occupy, with their offshoots, a great part of the surface. Old red sandstone occupies the s. and middle of the co., and silurian rocks the north. The chief rivers are the Wye, Usk, Yrfon, Elan, Claerwen, and Tawe. The climate is severe and rainy but healthy among the mountains, and in the valleys comparatively mild. The agriculture, though still defective, especially in the higher districts, was greatly improved by the Brecknockshire agricultural society, instituted in 1755. The chief crops are oats and barley, but much wheat is also grown in Talgarth and Crickhowell, the most fertile districts of the county. In the valleys in the e. some hops are raised, and some orchards are seen. The native small black-cattle are reared in the hills, while in the lowlands the Hereford breed predominates. The mineral produce is small, consisting of iron, especially along the s. border; coal and limestone are also found in the south and west. The Brecon canal connects the co. with the Bristol channel, and many railways have been constructed throughout the county. There are several small factories of woolens and worsted hosiery; also several important iron-works, but the ore is chiefly obtained from adjoining counties. B. returns one member to parliament. Pop. in 1871, 59,901. The chief towns are Brecon, the co. and only corporate one, Builth, Crickhowell, Hay, and Llanelly. There are many remains of British and Roman camps, Roman roads, cairns, cromlechs, mounds, and castles throughout the county. B. formed part of the territory of the Silures, who bravely withstood the Romans. The Normans, under Barnard Newmarch, wrested the co. from the Welsh princes in 1092. Llewelyn, the last British prince of Wales, was killed in this co. in 1282, and by his fall the native mountain-chiefs were entirely subdued. Half the people in B. still speak Welsh. Pop. '81, 57,735.

BRECON, Brecknock, or Aberhonddu, the capital of Brecknockshire, South Wales, is situated in an open valley in the middle of the co., at the confluence of the Usk, Honddu, and Tarell, 171 m. w.n.w of London. It lies in the midst of fine mountain scenery, and has beautiful public walks. South of B. lie the three mountain-peaks, the Brecon beacons. Pop. '81, 6372. It returns one member to parliament. Flannels, coarse woolens, and hats are manufactured. Barnard Newmarch, a relative of William the conqueror, founded the town, and built a castle here in 1094. He also founded two priories here in the reign of Henry I. Henry VIII. turned one of the priories into a college, still existing; the other is now the parish church. B. was formerly surrounded by a wall, having ten towers and five gates. Hugh Price, founder of Jesus college, Oxford, and Mrs. Siddons, the celebrated actress, were natives of Brecon.

BREDA', a t. of North Brabant, Holland, situated at the confluence of the navigable rivers Merk and Aa, and containing (Dec. 31, 1879) 17,109 inhabitants. It formerly pos-

sessed the means of laying the surrounding country uuder water in the event of an attack, but the importance of the town, as a military position, has passed away, and in 1876 the fortifications were removed. It has a Gothic cathedral, with a lofty tower and several interesting monuments; also an old castle built in 1350, which was for some time the residence of Charles II. of England, and is now a military academy. There are manufactures of carpets, linen, hats, soap, leather, etc., and dye-works, breweries, and rope-walks. It is celebrated as the place where, in 1566, the protest of the Dutch nobles, known as the "compromise of Breda," against the measures of Philip II. of Spain in the Netherlands, was presented and rejected. During the subsequent centuries, it was the scene of much conflict and diplomatizing until 1813, when the French were finally driven out. B. is now a station of the railway net.

BREDA, Jan Van, 1683–1750; a Dutch painter. He imitated Wouvermans and Breughel so cleverly that connoisseurs are often unable to detect the copy. B. was a long time employed in England.

BREDERO'DE, Hendrik Van, Count, 1531–68; one of the sovereign counts of Holland, and a leader against Spanish domination in that country. He was for many years turbulent, active, and a source of annoyance about as much to his own party as to the other. After the complete success of the Spaniards he asked Egmont to intercede for him with the regent; his followers were dispersed, some were put to death, and he himself died in a few months from intemperance and anxiety.

BREDOW, Gabriel Gottfried, 1773–1814; a German historian and professor in the university of Breslau. English readers know his *Manual of Ancient History; Researches on History, Geography, and Chronology*, and *Historical Fables.*

BREE, Matthæus Ignazius van, an excellent Flemish painter, b. at Antwerp 22d Feb., 1773, and educated partly there, and partly under Vincent in Paris. As early as 1798, he attracted attention by his "Death of Cato," and several other excellent pictures soon followed. A peculiar talent for rapid and vivid sketching enabled B. to execute for Napoleon, in a few hours, "The Maneuvering of the Fleet before Antwerp on the Scheldt," and, with equal celerity, Napoleon's "Entrance into Amsterdam, at the Moment when the Magistrate presents him with the Keys of the City." In 1816, he painted the famous Leyden burgomaster, Van der Werff, in the act of addressing the famished and murmuring populace during the siege of 1576: "Take my body, and share it among you." This great work—now in the town-house of Leyden—is marked by a felicitous arrangement of the figures, and by a bold and lively coloring, after the style of Rubens. Other celebrated pictures of B.'s are: "Count Egmont receiving Spiritual Consolation before his Execution," "Rubens dictating his Dying Testament," "The Tomb of Nero at Rome, with a Group of Lazzaroni and Musicians." B. died 15th Dec., 1839. In the latter part of his life, he was director of the academy of fine arts at Antwerp.

BRÉE, Philipp Jacob van, brother of the preceding, b. 1786, also acquired some reputation as a historical painter.

BREECH, of a gun, is the end farthest removed from the muzzle. It always contains a great mass of metal, to enable it to withstand the shock occasioned by the explosion of the gunpowder. For details, see Cannon, Howitzer, etc.

BREECHES BIBLE. See Bible.

BREECHING, of a naval gun or carronade, is a strong rope by which the recoil of the gun is checked at such a point that the muzzle is brought wholly within the port-hole, where the seamen can sponge and reload it.

BREECH-LOADING, in artillery, relates to a mode of constructing large pieces of ordnance, and small-arms or hand-firearms, the peculiar manner of charging which the term describes. This subject is now occupying much attention, and the patented inventions relating to it are very numerous. The Armstrong gun (see Armstrong), among others, is a breech-loader; and so is the Whitworth gun. A considerable amount of additional mechanism is necessary for this purpose; seeing that the breech must be so far opened as to admit of the introduction of a ball or shell, and a cartridge, and then so firmly closed as to resist the immense pressure occasioned by the explosion. The objects sought to be attained by this change from the old system are many—quickness in loading, ease in cleaning after firing, accurate adjustment of the diameter of the ball to the calibre of the gun, facility in making the ball accommodate itself to the spiral rifle-grooves of the piece, etc.; but it is still a contested question, especially between the rival inventors of breech-loaders and muzzle-loaders, to what extent these objects are attained. In relation to muskets and fowling-pieces, Mr. Greener, of Birmingham, who has written much on the subject, disputes the usefulness of B.; he denies that it is more safe, more accurate, or more forcible than muzzle-loading; while certain advantges which it may possess are, he thinks, counterbalanced by the greater cost of the weapon. The relative merits of breech and muzzle loading fowling-pieces were tested in 1859–60 by various trials, under the management of the editor of *The Field*, and resulted in favor of the breech-loaders. The demand for the latter has, in consequence, enormously increased.—This subject receives further notice in various parts of the Encyclopædia, in relation to certain kinds of ordnance and small-arms expressly constructed on the B. principle. See Breech-Loading.

BREECH-LOADING ARMS AND NEEDLE-GUNS. To be loaded at the breech, and to be fired by the penetration of a needle into, or the impinging of a piston on, a detonating cap within the cartridge, are distinct attributes in a weapon; and although it is only within the last forty years that the system has been carried out with success, breech-loading arms have been tried, accepted, and abandoned without number during the last three centuries. Indeed, a sort of instinct dictates that loading at the breech is the preferable course; and all the earliest muskets were so made, the system being doubtless abandoned from the difficulty of accurately closing the breech, in those days of rough workmanship. The extraordinary efficacy of breech-loading arms for military purposes was brought prominently forward during the wars of the last few years, and notably in the Prussian campaigns of 1864 against Denmark, and of 1866 against Austria. The successes of the Prussian arms were attributed in no small degree to the rapidity with which their troops could fire as compared with the enemy. They had, in greater or less numbers, borne these same rifles since 1835, but these were the first opportunities of using them in warfare. To all the other powers, whose men still carried muzzle-loading rifles, and who had debated, without practical result, for years past the question of armament with breech-loaders, soldiers thus armed appeared irresistible. From July, 1866, to the present moment, the hammer and the anvil have been busy night and day throughout the civilized world in making the weapons of death yet more deadly. Scarcely two countries seem to have adopted the same plan: each nation has elaborated a system from among its own inventors. Those possessing no great reserve of rifles have prepared new arms; but the majority of governments have been content, in the first instance, to convert their existing stock into breech-loaders of as good a construction as circumstances would permit. Thus, Britain, after offering a handsome prize for the best design, selected one said (subject to some controversy) to be the invention of the late Mr. Snider. As this weapon has been produced already to the number of a million, and as it has confirmed the favorable auguries entertained of it by accuracy of fire, and by loading thrice to the muzzle-loader's once, much of the following article will be devoted to a consideration of it. At the same time, it is to be borne in mind that the British government only regarded the Snider arm as a makeshift for the conversion of the enormous stock of Enfield rifles then in hand, reserving to itself the ultimate selection of a pattern on which to manufacture new weapons. It is not to be understood from what is said above that Britain adopted a breech-loading arm in a sort of panic *after* the battle of Sadowa. It was after the Danish campaign, on the 11th July, 1864, that it was decided as an abstract question to arm the British infantry with breech-loaders; a portion of the cavalry having for a number of years previously been armed with Sharp and Westley Richards carbines, loading at the breech. The selection of an arm took longer; but by the beginning of 1865 it had been decided to convert our great stock of rifles on the "Snider" system. In 1869 it was determined that new arms should be on the Martini-Henry system—i.e., with the Henry barrel, and the Martini-breech action. A description of this rifle will be given farther on.

Breech-loading.—The advantage of breech-loading is obvious: to be able to insert the charge at the breech end instead of the muzzle, is to save time, and to avoid exposure to hostile fire during the operation of loading and ramming home, which involves considerable outstretching of the limbs. The great condition of success is, that the bullet shall be propelled with equal force and accuracy, and with equal safety to the rifleman, as from the muzzle-loader.

When a charge is ignited, the constituents of the gunpowder, assuming a gaseous condition under the heat engendered, expand into a volume of light gas many times greater in bulk than the powder before occupied. On the amount of this expansion, and its sudden action on the projectile, the force of the shot depends. Any joint in the breech-piece through which a portion of this gas can escape, without having imparted its thrust to the ball, tends, therefore, to lessen the range and penetration; while the shock of the explosion falling more severely on this than on any other part of the barrel, tends yet more to dislocate the breech-piece, and diminish the closeness of the joint's fit. In weapons which do not call for a long range, as revolver pistols, a perceptible interval is left between the chamber and barrel, through which much gas escapes; but in rifles, which have range and penetration as principal objects, there is *primâ facie* ground for preferring a muzzle-loader. The gas, however, is far from pure as generated in the barrel, for much water is produced and held in suspension, while there is also a solid residuum consisting of unburned materials of the powder. In the muzzle-loader, these clog (or, technically, foul) the barrel, filling the grooves, and rendering the ramming home of succeeding charges more and more difficult. The effect is, that a solid mass of unburned matter is gradually forced by ramming into the head of the barrel, destroying the accuracy and usefulness of the weapon. In the breech-loader, this solid deposit must be provided against both ways. The backward throw on firing (for, of course, the charge explodes with equal power in every direction) tends to force it into the mechanism of the joints, preventing their proper fit, and continually augmenting the escape of gas; and on the other hand, the deposit in front is most detrimental to accuracy of fire. This protection of the breech-apparatus, the prevention of fouling, and the retaining and if possible improving the force and accuracy of fire, were the problems which inventors have had to solve.

A moderate escape of gas in front of the first position of the ball, is not found to be any material disadvantage. If, then, the barrel could have an opening where the cartridge could be inserted, and then pushed backwards, an escape of gas through the joints by which the opening might be subsequently closed would be comparatively immaterial; but this formation would be impracticable, because the explosion of each cartridge would drive the fouling more and more backwards, till ultimately the chamber at the breech would be unable to contain the cartridge. It is clear, therefore, that the charge must be inserted either at the barrel's head, or, if the barrel be opened, in a space close to the barrel's head. In either of these cases, the breech must be solidly closed to resist the explosion. A third case, as in the Snider, is where the cartridge is inserted and then pushed forward, the aperture being closed by a solid breech-piece which completely fills that portion of the barrel, and forms, with the barrel's head, a massive foot to resist the backward pressure of the fired powder. No breech action can be made to fit so accurately as to prevent a backward escape of gas unless a properly-constructed cartridge-case is used A perpendicular moving joint is found, in practice, to be the best adapted for preventing a serious escape of gas. In the Prussian needle-gun, the end of the barrel is the frustum of a cone, which fits into a corresponding cavity in the fore-end of the breech-piece, but in practice this joint is not sufficiently tight to prevent an escape of gas from the self-consuming cartridge used with this gun, which becomes inconveniently great after long use of the weapon, and it is only available when the breech-piece is pushed up from the rear. In the Snider and several other breech-loading weapons, the cartridge is made itself to close hermetically the aperture between the barrel and the fore-end of the breech-piece. This is effected by the expansion of the cartridge-case, which, being composed of metal, or a combination of metal and paper, is driven out by the force of the explosion till it completely fills the chamber and prevents any escape backwards between the sides of the case and the chamber. The cartridge has a portion of its case at the base flattened out into a rim which fits into a corresponding recess in the end of the barrel; and to prevent expansion backwards, which would fracture the cartridge-case, and injure the breech or the firer. the breech-piece is made to fit as closely as possible against this base. This rim is on the Snider cartridge.

The remainder of the article will be devoted to a description of the three most prominent breech-loaders—(1) the Prussian Zündnadelgewehr; (2) the British Snider; and (3) the Martini-Henry.

The Prussian gun, although it may be said to be now obsolete (having been superseded by the Mauser, a bolt gun on much the same principle, but using a metallic cartridge-case), was first in the field. As regards its breech-apparatus and needle-lock, it consists of three concentric hollow cylinders, with a solid cylindrical bolt inside the last. The rear-end of the barrel is firmly screwed into the head of the chamber, which is fixed to the stock of the piece, and is open at the rear-end. The upper half of the cylinder is cut away at the front-end for rather more than the length of the cartridge: this constitutes the opening in which the musketeer inserts the cartridge. From the rear of this opening to the back, a groove is cut, sufficiently wide to allow the square pillar of the breech-handle to pass along it. In the middle of this groove is a right-angled shunt, offering a stop to the breech-handle when drawn backwards, unless it be likewise turned downwards, when it may be passed completely out at the rear-end. Next within the chamber is the breech-piece, which, to admit the cartridge, is drawn back for a sufficient distance by the breech-handle along the groove. When the cartridge is deposited in the recess in the chamber, this breech-piece is closed against the heel of the barrel by moving up the handle to the front-end of the groove, and then turning it down to prevent it from being driven back on the explosion of the charge; representing, indeed, the resistance offered by the heel of an ordinary muzzle-loading barrel. Firmly screwed within the breech-piece, at a short distance from its front, is a solid block of metal, on which impinges the first force of the explosion. Projecting from this block to the base of the cartridge is a strong *tige*, or pillar, around which a space containing air is left. Through this pillar is the channel for the needle to work. Fitting within the rear-end of the breech-piece is a smaller cylinder, constituting the lock of the gun. It slides within the breech-piece, and is retained from falling out backwards by the spring, which catches in a notch. Along the bottom of this cylinder is a groove to admit the passage of the trigger; and at the back is a short upright handle, by means of which the weapon is cocked. Lastly, within the lock is a bolt, pressed forward by a spiral spring, and having the needle rigidly fastened to its front end. Having now described the several parts of the rifle, it is easy to follow it from the moment of a shot being fired until the next is ready for discharge. The soldier first presses down the spring with his finger, releasing the catch below it, and enabling him to draw back the lock to the next catch on the spring. Having done so, he raises the breech-handle to the perpendicular, and passes it along the groove to open the breech. This done, he places the cartridge in the opening thus made in the chamber, and again moving up the breech-piece to close the breech, the tige in it pushes the cartridge forward into the barrel, and the rifle is at once at "half-cock;" for in drawing back the lock, the front point of the spring forced the bolt (including the needle) with it, and the projection on it, having passed over the head of the trigger, is caught by the latter in a way which can only be released by the falling of the trigger. It will be observed that at

half-cock the needle is ready to penetrate the cartridge, but that the spiral spring is loose and without power. The position is now obtained, in which the bolt projects at the back, and the spiral spring is compressed into a state of passive strength. All that is now needed to fire the gun is to press upon the trigger, when the bolt, being released by the depression of the spiral spring, asserts its power, and drives the needle into the heart of the cartridge, the parts all resuming their original positions. At first sight, one cannot help exclaiming: "What a complicated apparatus with the four cylinders and the springs!" but, in reality, it is as simple as almost any other gun, for the whole mechanism of the lock (q.v.) is dispensed with. If it be desired to take the needle-gun to pieces, press the trigger till the point bears. If the breech-handle be then in the hinder part of its groove, the breech-piece with its contents will slip out of the chamber. Pressing down, next, the spring until the second catch is passed, there is nothing to retain the lock in the breech-piece; and the lock being free, the needle, with its attached bolt and spring, falls readily out of its fore-end. The gun is thus taken to pieces in a few seconds, and as many suffice to put it again in fighting order. The most delicate portions are the needle and the spiral spring; but in case of accident to these, there is a spare one in a small cavity opening by a spring in the butt-end of the stock. The worst feature about this celebrated gun is its weight, 12 lbs., or 33 per cent heavier than the Enfield or Snider rifle.

The converted Enfield or "Snider" rifle was selected in 1865–66 by the British government from the specimens submitted at an open competition of inventors. It is an extremely simple weapon, and though by no means free from faults, has given very satisfactory results up to this time. The ordinary Enfield barrel is shortened by about 2½ in., and the heel of the remainder is screwed in to a strong shoe, with which is connected by a powerful hinge, the solid breech-piece, which, when shut, completely closes the breech. Through this passes the piston or striker; the normal position of the piston is maintained by a spiral spring within the nipple. Given the breech open, the cartridge is inserted and pushed forward into the barrel, where its metal rim fills the groove left around the barrel's heel. The breech-piece is closed down, the hammer drawn to full-cock, and the piece is ready for discharge. The breech-piece is securely locked by the spring bolt, which enters a recess in the false breech, and can only be withdrawn on the lever thumb-piece being pressed by the thumb in the act of again lifting the breech-block. On the trigger being pulled, the hammer falls, drives in the piston, and out against the detonating cap of the cartridge, with a sharp blow, firing the charge. The hammer is drawn back to half-cock, the piston flies up to its former position; the breech-piece is thrown back, and slid on its hinge along the pin until occurs a process during which a small catch hooks back into the breech, by its projecting rim, the empty cartridge-case. The canting of the rifle to one side now throws this out, a spring within the hinge moves the breech-piece to its former place, and the gun is ready for another charge.

The cost of altering an "Enfield" to a "Snider" varies from 15*s.* to 20*s.* During the transition period, upwards of a million were converted in this way, besides a large number of new arms made for our own government; but conversion and manufacture are now suspended both in the government factories and by the large small-arms companies. The government factories were capable of converting 1100 rifles daily.

At first, the firing of the Snider was inferior to the old Enfield; but, by alterations in the bullet, effected by col. Boxer, in the direction of decreasing the specific gravity at the apex by the insertion of a wooden plug (which is now, however, dispensed with, and the point of the bullet spun over the mouth of the cavity), this condition has been reversed, and the Snider now fires 30 per cent better than the old Enfield. Of course, these changes add to the cost of the cartridge, which has, however, these great perfections—first, that it is absolutely impervious to wet; and second, that fire can scarcely be communicated to it otherwise than through the detonating cap. A single cartridge has been fired within a barrel of loose cartridges without exploding any of the others.

Adverting to the Snider cartridge, the whole is inclosed in a roll of thin brass foil, outside which is a covering of paper, and having for its base an iron disk, in front of which is a double cup of thin brass, while a round of millboard or pulp encircles the chamber containing the percussion-cap, which communicates with the powder. Between the powder and the ball is a layer of wool. The ball has, as explained above, the point spun over a cavity in its front, and a conical hollow is made at the base; into the wider part of this is dropped the wooden plug, while on the circumference of the bullet, and outside this conical hole, are four small cannelures or cuts in the lead. When the powder explodes, the wooden plug is driven forwards to the head of the hollow, driving the base of the bullet outwards till the lead completely fills the grooves of the rifle—a process aided by the comparatively less resistance at the cannelures. These cannelures are also receptacles for a wax lubrication which prevents fouling, interposing always a film of wax between the bullet and the barrel. The charge and bullet are held together by the copper sheathing being pressed into the cannelures. Returning to the percussion-cap, wes hould find, if it were enlarged, an apparatus where the cap is a thin copper cylinder open at front and closed at the rear end, where there is contained a deposit of detonating powder, of great sensitiveness. A brass bead, called the "anvil," is contained within the cap, the sharp point being next the detonating powder, and its broader

end resting at the bottom of the cap-chamber on each side of the hole. The cap itself fits tightly into the chamber, leaving no opening for the escape of gas backwards from the explosion, and is fired by the external blow of the piston or striker, which drives the base of the cap down upon the point of the anvil, by which means the detonating powder is exploded, and the flash, passing down the sides of the anvil, communicates through the opening with the powder in the cartridge. The weight of the bullet is 480 grains; of the powder, 70 grains; the cost being about £3 per thousand.

From this description, it is evident that the Snider cartridge is a complicated arrangement; but it is not much more so than that of the Zündnadelgewehr, though vastly more efficient.

In comparing the Snider and the Prussian gun, the former has certainly the greater simplicity; while its smaller weight (9 lbs. to 10¾ lbs.) is an immeasurable advantage. Of the two it is probably the less likely to get out of order, but would perhaps be the most difficult to restore if it did. There is this difference of a material character between the two weapons, that in the Prussian arm, the needle, by its own mechanism, fires the charge; while in the Snider, it is a mere medium for conveying the blow of the hammer.

The principle of the action of the Martini-Henry rifle, which has been adopted by the British army, consists in closing the breech by a falling block, working in a mortised breech body, and hinged on a pin at the back end, and falling in front sufficiently when open to clear the opening of the barrel; the top of the breech-block forms an inclined groove, along which the cartridge is slipped into the barrel. The ordinary gun lock is replaced by a direct acting striker, impelled by a spiral spring, both being contained within the breech-block. The act of opening the lever draws down the breech-block, simultaneously drawing back the striker, and compressing the spiral spring; at the same time the toe of the cranked extractor is struck by the breech-block, thus throwing its upper claws, which encircle the base of the cartridge-case, backward, and jerking out the used case. On a fresh cartridge being inserted, the lever is drawn back and fixed to the stock by the spring. This closes the breech, but the spiral spring is kept compressed, and the striker at the full-cock position, by the tumbler, into the bent of which the point of the trigger and the tumbler-rest entered when the breech was opened. The trigger being pulled, the tumbler is let loose, and the spiral spring discharges the pointed end of the striker on to the cap in the rear-end of the cartridge, which is thus fired.

The following table shows the breech-loading rifles in use in 1883 by the principal powers:

Country.	System adopted.	Bore.	Weight of rifle.	Weight of bullet.	Weight of powder.
		Inch.	Lbs.	Grains.	Grains.
Austria	Werndl	.450	9.88	318	65
Belgium	Albini-Braendlin	.433	10.14	386	77
Denmark	Remington	.450	9.08	370	66
England and Turkey	Snider	.577	9.05	480	70
	Martini-Henry	.450	8.75	480	85
France	Converted Chassepôt	.433	8.93	386	75
Germany	Mauser	.433	10.75	385	74
Holland	Beaumont	.433	9.59	336	66
Italy	Vetterli	.412	6.61	308	58
Russia	Berdan	.420	8.48	370	78
Sweden	Remington	.480	9.55	370	66
United States	Springfield	.450	9.13	370	78

The breech-loaders with and without the needle arrangement are too numerous even for mention. In addition to what are known as breech-loaders proper, there are repeating-arms, one of the most remarkable of which is the Spencer magazine rifle, having, in a tube in the stock, a series of cartridges, which, by a simple action, pass into the barrel for discharge. As the gun can ordinarily be loaded at the breech without drawing on the magazine, it is doubtless that this reserve would be a powerful means of defense in a moment of danger, as in resisting cavalry; but among its drawbacks are weakening of the stock, serious increase of weight, and, worst of all, great complexity and delicacy —fatal objections in the rough usage of active service. Nearly all sportsmen now use breech-loading guns. One type of weapon has *attachable* magazines.

BREECH-LOADING GUNS (*ante*). The introduction of these arms in the United States dates properly from 1865, from which date muzzle-loading arms were no longer manufactured at the Springfield armory. A short time before the late rebellion, the government tested a number of breech-loading guns, such as the Burnside, Cosmopolitan, Gallagher, Joslyn, Merrill, Maynard, Smith, Lindner, and Sharp. None of these are now used except the Sharp gun, which has been adapted to the metallic cartridge. During the war the Spencer rifle was much used by the U. S. cavalry; it has a magazine in the butt of the stock, holding 7 cartridges that are admitted one at a time by the movement of the trigger-guard used as a lever. The shell of an exploded cartridge is expelled by the same movement. It may be used also as a single breech-loader, but the magazine must first be shut off. The Henry gun (not to be mistaken for the Martini-Henry gun) has the magazine under the barrel. By movements of the lever, 17 metallic

cases or cartridges can be brought into the chamber in succession. This gun, like the Spencer, can be used as a single breech-loader by shutting off the magazine. It has been changed, however, by O. F. Winchester, and is now termed the Winchester gun. Among other magazine guns may be mentioned the Ball, Fogarty, and Gardner guns. The well-known Remington gun is a single breech-loader, and has an iron receiver that is screwed to the breech of the barrel, in which the breech-block and lock are to be found. It uses metallic-cased cartridges, and has been adopted by the governments of Egypt, Spain, and several other countries. The Remington gun is used in the U. S. navy, and by the militia in some states.

In 1866, the secretary of war called a board of officers, gen. Hancock acting as president, to report the form and caliber which should be adopted for breech-loading muskets and carbines, and the method of converting muskets from muzzle-loading to breech-loading arms. After an examination of 22 different breech-loading muskets and 17 different breech-loading carbines, the board reported the best caliber for muskets to be 0.45 of an inch, the best charge of powder from 65 to 70 grains, and the best weight of ball from 480 to 500 grains. In 1869, a board of officers, presided over by gen. Schofield, was called to meet at St. Louis to select the six best patterns of muskets for infantry and carbines for cavalry. After examining a great number of different breech-loaders, they reported that the only guns suitable for military service were those of the Remington, Springfield, and Sharp systems. These guns were tried accordingly until 1872, when, in compliance with an act of congress, a board of officers, gen. A. H. Terry as president, was appointed to meet in New York and Springfield, "to recommend a breech-loading system for muskets and carbines to be adopted for the military service, which system, when so adopted, shall be the only one to be used by the ordnance department in the manufacture of muskets and carbines for the military service." After testing over 100 breech-loading guns, the board recommended (May, 1873) that the Springfield breech-loading system be adopted for military service, and this report being approved, that system is now used by the government for the U. S. army and militia. This breech-loader has a receiver screwed to the breech of the barrel. The shell of the exploded cartridge is ejected by a combined cam and spring through a motion of the hinge in the opening of the breech-block. The firing-pin goes through the breech-block in an inclined direction from the nose of the hammer at the side to the center of the rear of the chamber, where it strikes the head of the cartridge, exploding the fulminate when its rear end is struck by the hammer.

BREED, in domestic animals, a variety or often merely a race distinguished by the possession of particular qualities, but not differing from the ordinary type of the species so as to constitute what naturalists usually designate a variety. The peculiarities of breeds in animals find an exact counterpart in cultivated plants, the value of particular kinds often depending, in a great measure, upon characters scarcely capable of being defined in the language of scientific description, but to the production and perpetuation of which the attention of the cultivator cannot be too earnestly directed. These, also, in plants, as in animals, have of themselves little permanence, and the preservation or perpetuation of them depends upon the same assiduous attention and high cultivation from which, more frequently than from any mere accidental circumstances, they have originated. Thus it happens that the most improved varieties of garden-plants usually degenerate even under ordinary horticultural treatment, and the choice pansies of the florist lose their characteristic excellences if a place is simply assigned to them in a common flower-border. The improvements which cultivation has effected in the productions of the fruit, flower, and kitchen garden do not, however, possess an economic importance to be compared to that of the similar improvements in the cereals and other plants cultivated on the most extensive scale, or in the breeds of some of the most valuable domestic animals. To the breeding of these, great attention has of late been paid—probably more since the beginning of the 19th c. than in all the previous history of the world—and with results the magnitude of which may in some measure be estimated from the statement made on very competent authority, that within the last thirty years the weight of mutton produced has been about doubled in proportion to the number of sheep kept To the improvement of the B. of horses, attention has been paid for a much longer time than to that of oxen and sheep; and to this must, in a great measure, be ascribed the different excellences of some of the well-known breeds employed for very different purposes. The use of the horse in war, and for purposes of pomp and luxury, appears to have been the reason of the higher degree of attention thus paid to it, even from ancient times. The Arabs have long been particularly careful of the B. of their horses, and diligently preserve a record of their pedigree. What is called *blood* in horses, however, only fits them in a higher degree for certain purposes; and with regard to this as to other animals, the judgment of the breeder must be exercised, as the perpetuation, increase, or combination of particular qualities may be the object which he has in view. Fleetness and strength are important qualities in horses, the extremes of which never co-exist in the same animal, but of which a certain combination is for some purposes very desirable; and either of these may be displayed in a great degree without much *bottom*, or power of enduring continued severe exertion—a quality of very high value. The properties most desired in sheep and oxen are very different from those most highly esteemed

in the horse—the fleece and the flesh being chiefly regarded in sheep, the flesh and the milk in oxen. Sometimes a perpetuation of good qualities is the great object of the breeder, and a combination of them in the highest possible degree is aimed at; sometimes, the production of the largest possible quantity of beef or mutton in the shortest time being almost exclusively designed, the breeder neglects considerations which would be of importance if his stock could not be improved by animals obtained from other quarters. Extraordinary differences are certainly found to exist among animals of the same species in the readiness with which they convert food into flesh and fat, and in the age at which they are fit for the hands of the butcher. One effect of the attention bestowed of late upon the breeding of stock, has been to supply the market, to a great extent, with the flesh of younger animals than could previously be sent to it—a change evidently tending not only to the benefit of the farmer, but to the increase of the national wealth; because that land, even without increased produce of grass, sends a greater amount of beef and mutton to market within the same term of years. Those sheep and oxen which exhibit in the highest degree the qualities just referred to, are also characterized by shortness of legs, smallness of bones, smallness of head, and fineness of skin; qualities the very opposite of those which would fit the animal for a wild state and an independent existence.

Some of the most important breeds of domestic animals will be mentioned under their proper heads. It remains for us only to allude here to the rules and physiological principles of breeding; but the latter, in so far as application of them has yet been found practicable, are only the best known principles of physiology (q.v.). In a great measure, however, the rules which guide the breeding of stock have been learned by experience, and are rather to be regarded as contributions to science than as deductions from it. The probable relative influence of the male and female parent upon their progeny, is a point unquestionably of the greatest importance, but concerning which widely different opinions have been maintained; and another much controverted and important point is, the propriety of *breeding in and in*. Practically, the rule is always observed, by those who seek the improvement of a *breed*, of selecting the very finest animals possible, both male and female; although a great improvement of the existing stock on a farm is often effected in the most advantageous manner by the mere introduction of males of better quality. The dangers of breeding *in and in* are very generally acknowledged, even whilst it is contended that they may very much be obviated by careful rejection of every faulty animal, and that in this way the utmost advantage may be taken of the very highest improvements; but it is likewise very generally admitted that, if equally improved individuals can be obtained not so nearly related, it is better to seek the perpetuation of the B. by their means. It is a rule also of much practical importance, that an improvement of B. is to be attained not by a *cross* between animals of very different breeds, as between a dray-horse and a race-horse, but only between those which are comparatively similar. The result of the intermixture of very dissimilar breeds is never in any respect satisfactory.

BREED'É, a river in Cape Colony, flowing chiefly through the district of Zwellendam, which contains cape Agulhas, the most southerly point of Africa. It rises in the Warm-Bokkeveld, a mountain-basin about lat. 33° 10′ s., and long. 19° 30′ e., running first to the w., and afterwards to the s.e.; and it enters St. Sebastian's bay or Port Beaufort, from which, upwards, it is navigable to a distance of 40 miles. Its exports are wool, aloes, skins, feathers, grain, butter, cattle, mules, etc.

BREEZE. See Wind.

BREESE, Samuel L., 1794–1870; b. New York. He entered the U. S. navy, serving in the war with England and Mexico, but was retired before the war of the rebellion broke out, his rank being rear-admiral.

BREESE, Sydney. See page 877.

BRE'GENZ, a frontier t. of Austria, capital of the district of Vorarlberg, is situated at the mouth of the small river Bregenz, which here flows into the lake of Constance, between the Swiss and Bavarian territories, about 80 m. w.n.w. of Innsprück. From the ruins of the castle of Hohenbregenz, on a hill near the town, a very beautiful prospect is obtained of the lake and its surrounding vineyards, etc. B. is one of the oldest towns, and was formerly one of the chief fortified places in the southern part of Germany. The inhabitants (1880), 4736 in number, are engaged in agriculture, horticulture, and cattle-keeping. Cotton-spinning and weaving are also carried on; and articles of wood, gold, and iron are manufactured. Its position secures B. a large transit-trade in the produce of the district. In the neighborhood lies the mountain-pass, the *Bregenzer-Klause*, formerly a strong military position between Swabia and the Tyrol. During the thirty years' war, the Swedes, in 1646, stormed and captured the fortress of B., and destroyed the works in the pass.

BRE'HON LAWS (in Irish, *dlighidh breitheamhuin*—that is, "judges' laws"), the name usually given to the system of jurisprudence which prevailed among the native Irish from an early period till towards the middle of the 17th century. The *breitheamhuin* (pronounced *brei-hoo-in*, or *brehon*), from whom the laws had their name, were hereditary judges, who administered justice among the members of their tribe, seated in the open air, upon a few sods, on a hill or rising ground. The poet Spenser, in his

View of the State of Ireland, written in 1596, describes the B. L. as "a rule of right unwritten, but delivered by tradition from one to another, in which oftentimes there appeareth great share of equity, in determining the right between party and party, but in many things repugning quite both to God's law and man's: as, for example, in the case of murder, the brehon—that is, their judge—will compound between the murderer and the friends of the party murdered, which prosecute the action, that the malefactor shall give unto them, or to the child or wife of him that is slain, a recompense, which they call an *eric;* by which vile law of theirs many murders amongst them are made up and smothered: and this judge being, as he is called, the lord's brehon, adjudgeth for the most part a better share unto his lord, that is, the lord of the soil, or head of the sept, and also, unto himself for his judgment, a greater portion than unto the plaintiffs or parties grieved." Spenser was ignorant that pecuniary compensation for manslaughter had obtained in the ancient laws, as well of England as of most European nations. He was mistaken, too, in believing that the B. L. was an unwritten code. Many manuscript collections of the B. L. still exist in public and private libraries in Ireland, England, and Belgium. These manuscripts are regarded as varying in date from the early part of the 14th to the close of the 16th century. For the laws themselves, a much higher antiquity is claimed. On this point, we must be content to quote what has been said on the part of the very few persons who have had an opportunity of making themselves acquainted with the existing collections of the brehon laws. "So far as we have external evidence to guide us," say Dr. J. H. Todd and Dr. C. Graves, two eminent Irish antiquaries, "there is no reason to suspect that the brehon laws have undergone any material change since the time of Cormac Mac Cuilleanain, king and bishop of Cashel, who died 908 A.D. He was a man of great learning and energy, who certainly promoted the execution of considerable literary works, and under whose influence it is not improbable that a systematic compilation of the laws may have been effected. Of this, however, we have no distinct record. On the other hand, we find scattered through all parts of the laws allusions to a general revision of them made in the 5th c., at the instance of St. Patrick, who, in conjunction with certain kings and learned men, is said to have expunged from them all those institutions which savored of paganism, and to have framed the code called the Seanchus Mor. These same documents assert the existence of still more ancient written laws, the greater part of which are ascribed to Cormac Mac Art, monarch of Ireland, in the middle of the 3d century. However slow we may be to acquiesce in statements of this kind, which contradict what we have learned concerning the progress of legislation in the remaining parts of western Europe, we may readily admit that the subject matter of many of the laws demonstrates their great antiquity, as it indicates the primitive nature of the society in which they prevailed. In spite of the attempts to efface it, traces of heathenism are still discernible in many parts of them. They enumerate various ordeals of a pagan character, which are expressly termed *magical,* and specify the occasions on which a resort to them was prescribed. There are also provisions in the laws of marriage which prove that Christianity could have exercised but a feeble influence at the time when they were enacted. The language in which the brehon laws are written is a convincing proof of their antiquity. They are not composed in a peculiar dialect, as many writers have maintained; but if their style differs from that of the vernacular Irish of the present day, as Anglo-Saxon does from modern English, this dissimilarity is to be ascribed mainly to the effects of time, by which the orthography and grammatical forms of the language have been modified, and legal terms and phrases of constant recurrence have become obsolete." The world of letters will be able, in no long time, to judge for itself on the opinions thus expressed. It is now upwards of twenty years since the publication of the B. L., at the charge of the Irish government, was strongly urged by such men as Guizot, Grimm, and Rank abroad, and Hallam, Macaulay, and earl Stanhope at home. A commission was accordingly appointed by the earl of Eglinton in 1852, "to direct, superintend, and carry into effect the transcription and translation of the ancient laws of Ireland, and the preparation of the same for publication." The commissioners intrusted the transcription and translation of the B. L. to the two most eminent of Irish scholars—the late Dr. John O'Donovan, professor of Celtic in the queen's college at Belfast; and the late Eugene O'Curry, professor of Irish archæology in the Roman Catholic university of Ireland. These gentlemen having finished their task the editorship of the work was intrusted to Mr. W. J. Hancock, late professor of political economy in Trinity college, Dublin, and the Rev. Thaddeus O'Mahony, professor of Irish in the university of Dublin. The publication, it is reckoned, will extend to eight volumes, of about 550 pages each. Three of these have already appeared—the last in 1873—under the title of *Ancient Laws and Institutes of Ireland.* Along with the Irish text, an English translation is given, accompanied with preliminary dissertations, glossaries, and indexes, and they give a vivid and characteristic picture of the polity and social life of a Celtic people. A fac-simile reprint of the B. L. has recently been published in 17 volumes by the B. L. commission.

BREISACH′, ALT, a very old t. of the grand duchy of Baden, situated on an isolated basalt hill on the right side of the Rhine, about 12 m. w. of Freiburg. As early as the time of Julius Cæsar, *Mons Brisiacus* was known as a strong military position, and was

taken by Ariovistus when he invaded Gaul. Being regarded as the key to the w. of Germany, it was a prominent scene of action during the thirty years' war, at the conclusion of which it was ceded to the French. During the next century, it frequently changed masters, now belonging to France, and now to Austria. The French destroyed its fortifications in 1744, and during the war of the revolution in 1793, part of the town was burned by them. In 1806, the French handed it over to the house of Baden. The minster of St. Stephen is a venerable structure in good preservation, and contains several old monuments. Pop. '71, 3255; '80, 3258.

BREISACH, Neu, a t. in Alsace, opposite to Old B., 2 m. w. of the Rhine, on the Rhine and Rhone canal; pop. '66, 1981. It was fortified by Vauban by order of Louis XIV.

BREISLAK, Scipione, 1748–1826; an Italian geologist. He was professor in a Roman college, and devoted his leisure to geological researches in the papal states. The king of Naples appointed him professor of mineralogy to the royal artillery, and under his direction the sulphur refining works in the district of Solfatara were erected. In 1798, he published his *Physical Topography of the Campagna*, and followed with various works on similar topics.

BREI'TENFELD, a village and manor of Saxony, about 5 m. n. of Leipsic. It is historically remarkable for three battles, fought on a plain in its neighborhood. The first of these, between the Swedes and the Imperialists, which was fought on the 7th Sept., 1631, was of the highest importance to Europe, as it secured the permanency of Protestantism and the freedom of Germany. Tilly's pride had reached its highest point after the fall of Magdeburg, which took place on the 10th of May, 1631; and in the early part of Sept. of the same year, he advanced against the Saxons, with an army of about 40,000 men, for the purpose of forcing the elector, John George I. (who would not submit to the edict of restitution, and was treating with the Swedish king, Gustavus Adolphus), into an alliance with the emperor. No other way remained than for the elector to join the Swedish king, who had just entered Pomerania. Gustavus Adolphus, joined by the Saxons, advanced towards Leipsic, where Tilly lay, who advanced into the plain of Breitenfeld. The imperial forces were completely defeated, and their three most distinguished generals, Tilly, Pappenheim, and Fürstenberg, wounded. The second battle which B. witnessed again resulted in the triumph of Swedish valor: it took place on the 23d of Oct., 1642, between the Swedes, headed by Torstenson, one of the pupils of Gustavus, who had invested Leipsic, and the archduke Leopold, with gen. Piccolomini, who were advancing from Dresden to its relief. The Swedes gained a complete victory over the imperialists, who fled into Bohemia, leaving behind them 46 cannon, 121 flags, 69 standards, and the whole of their baggage. The third battle of which B. was the scene, was fought on the 16th of Oct., 1813, and was part of the great contest known as the battle of Leipsic.

BREITMANN, Hans. See Leland, Charles Godfrey.

BRE'MEN, one of the three free cities of Germany, is situated on the Weser, about 50 m. from its mouth. Pop. '80, 112,158, nearly all Protestants. B. is divided into the old and the new town—the former on the right, the latter on the left side of the river, which is spanned by four bridges. The ramparts and bastions round the old town have been leveled, and formed into public promenades, which are laid out with excellent taste. Among the principal buildings, the cathedral (built about 1160), the Gothic town-hall (begun about 1405), with its famous wine-cellar, said to contain hock of the vintage of 1624, the exchange, the museum, the post-office, and the observatory of Dr. Olbers, from which he discovered the planets Pallas and Vesta, are remarkable. The position of B. makes it the emporium of Brunswick, Hesse, and other countries through which the Weser flows. Besides its excellent water communication, it is connected by railways with the whole of western and central Germany. B. is an exceedingly thriving place, its trade having more than doubled within the last ten years. Large vessels stop at Bremerhaven, where there is a spacious harbor constructed, about 38 m. below B., with which it is connected by electric telegraph. Vessels not drawing more than 7 ft. of water can come up to the town itself. B. carries on an extensive commerce with the United States of America, the West Indies, Africa, the East Indies, China, and Australia. Its great foreign trade, however, is with the United States, from which alone, in 1880, it imported produce at the estimated value of 45,000,000 dollars, exporting in return goods to the value of 24,000,000 dollars. With the exception of Hamburg, no continental port ships so many emigrants to the United States as B., through its main port at Bremerhaven. The total number of vessels arriving at B. in 1874 was 3407, and the number departing, 3243. The number of ships belonging to the port in 1880 was 320, with an aggregate burden of 261,357 tons. In 1880, the value of the imports amounted to £27,920,000, exports to £25,565,000, a very great increase as compared with the year 1858, when the imports were valued at £8,237,000, and the exports at about £8,000,000. The chief imports are tobacco, coffee, sugar, cotton, rice, skins, dyewoods, wines, timber, hemp, etc. The exports consists of woolen goods, linens, glass, rags, wool, hemp, hides, oil-cake, wooden toys, etc. Large quantities of tobacco are re-exported. B. has manufactures of woolens and cottons, cigars, paper, and starch,

and extensive ship-building yards, breweries, distilleries, and sugar-refineries. The cigar and sugar manufactures have of late declined, the former on account of the increase of duty. In 1872, it is said that 2500 hands were engaged in making cigars. It has steam communication with New York, and Hull, Havana, the n. coast of South America, etc.

B. first became of historical note in the 8th c., when it was erected into a bishopric by Charlemagne. It soon attained considerable commercial importance, and became one of the principal cities of the Hanseatic league (q.v.). Having frequently suffered at the hands of the French, it was, in 1810, incorporated with that empire; but it recovered its independence in 1813, and by the congress of Vienna was admitted, in 1815, as one of the Hanse towns, into the Germanic confederation. In 1867, it became a member of the North German confederation, and now it forms part of the German empire. The area of its territory is about 100 sq.m.; pop., including the town of B. (1875), 141,848. The government is intrusted to a senate of 18 members, two of whom are chosen burgomasters, and to a municipal council of 150 burgesses.

BREMERHAVEN, a port on the Weser, near 10 m. from its mouth, was founded by Bremen in 1827, on ground acquired from Hanover, and soon became a thriving place. It has extensive docks and quays, and may be regarded as the seaport of Bremen. Pop. in 1875, 12,501.

BREMER, a co. in n.e. Iowa, on Cedar river; 430 sq.m.; pop. '70, 12,528; '80, 14,078; good soil, well watered and timbered. Communication is had by the Cedar Falls and Minnesota railroad. Agricultural productions. Co. seat, Waverly.

BREMER, FREDRIKA, the well-known Swedish novelist, was b. near Abo, in Finland, 17th Aug., 1801; but when she was only three years old, her father removed to Sweden. As a child of eight, she had already begun to write verses; and the works of German poets, Schiller more especially, exercised a most powerful influence over her youthful imagination. Her original novels first made their appearance under the general title *Tekningar ur Hvardagslifvet*, at Stockholm, in 1835. It was not, however, till 1842 that the English public hailed with delight the appearance, in an English dress, of *The Neighbors*, perhaps the most universally popular of all Fredrika B.'s charming pictures of domestic life in Sweden. Encouraged by its enthusiastic reception, Mrs. Howitt subsequently published translations of *The Diary, The H. Family, The President's Daughters. Brothers and Sisters, Life in Delecarlia*, and *The Midnight Sun*. In 1849, Miss B. visited the United States, and there spent two years, passing some time in England on her return. In her *Homes of the New World*, published simultaneously in England, America, and Sweden, in 1853, she not only presents us with exquisite descriptions of scenery, and vivid pictures of social life; but with sound and comprehensive views on political and moral subjects. Returning to her home in Sweden, to find a beloved sister dead, Miss B. devoted her talents and energies to the carrying out of certain philanthropic objects, in which she had throughout life felt deep interest, more especially the education of the poorest classes. As a writer of fiction, she is distinguished for feminine delicacy, shrewd sense, humor, deep knowledge of human nature, and a graphic and forcible style. Her works have been translated into almost all the languages of Europe. She died in 1865. Her life and unpublished writings were issued by her sister in 1868.

BRENDAN, or BRANDANUS, the legendary hero of great ocean voyages made under the protection of angels; revered in Ireland as a saint, where, and in England, he is supposed to have founded religious establishments. His death is set down in 578 A.D.

BRENHAM, the seat of justice of Washington co., Tex., on a branch of the Houston and Texas Central railroad, 72 m. w.n.w. of Houston; pop. '70, 2221; in '80, 4101. It is in a cotton-raising region. There are eight churches, the Live Oak female seminary, an opera house, and a number of manufactories.

BRENNER PASS, a pass in the main chain of the Alps, on the road between Innsbruck (q.v.) on the n. and Botzen (q.v.) on the s., connecting the s. of Germany with Venice and the n.e. of Italy. The B. P. is the lowest which crosses the main chain of the Alps, the summit being only 4775 feet above the level of the sea. Lofty mountains rise above it to the further height of more than 7500 ft., yet the scenery of the pass is less sublime and interesting than that of any other of the great passes of the Alps. It is open at all seasons of the year. At the summit of the pass is the village of Brenner, a resting-place for travelers, with a pop. of about 400. The climate here is so severe that corn seldom ripens. Here the traveler finds in close contiguity the Eisach, a small stream, which, after growing to be a considerable river, joins the Adige and the Sill, a tributary of the Inn; the one stream flowing to the gulf of Venice, and the other into the Black sea. On 18th Aug., 1867, a railway through the B. P. was opened, and thus a complete line of railway communication was established between Germany and Italy; Botzen having already been connected by a railway through the valley of the Adige with Verona, and so with the whole of Italy—Innsbruck being likewise connected with the railway system of Germany. This work was begun by the Austrian government when Venetia belonged to the Austrian empire, and with the view not only of facilitating military operations, but of restoring the commercial prosperity of Venice, by making it the port of southern

Germany. The prosecution of the works, however, was not arrested by the great political changes which took place. A liberal commercial treaty, recently made between Austria and Italy, binds the two countries together in community of interests, restoring, in fact, the natural state of things with which political animosities had long interfered; and it has been made quite apparent, from the activity with which the roads have been repaired on some of the Alpine passes, and particularly that of the Stelvio, that both Germans and Italians appreciate the importance of an intimate commercial intercourse. The distance from Innsbruck to Botzen in a direct line is only 52 m., but by the windings of the road or of the railway, it is much increased.

BRENNUS, the name or rather the title of several Gallic princes, is probably a Latinized form of the Kymric word *brenhin,* which signifies a king. The most famous B. was that leader of the Gauls who, in 390 B.C., crossed the Apennines, and hurrying through the country of the Sabines, at the head of 70,000 men, encountered and overthrew on the banks of the Allia (q.v.) the Roman army. Had the barbarians immediately followed up their advantage, Rome might have been obliterated from the earth; but instead of doing so they abandoned themselves to drunken delights on the battlefield, and gave the Romans time to fortify the capitol, whither were removed all the treasures and holy things of the city. When B. entered the gates he found that all the inhabitants of the city had fled, with the exception of the women and children, and old men, the last of whom, with pathetic heroism, had resolved not to survive the destruction of their homes, and so, the chief among them, clothed in their robes of sacerdotal or consular dignity, and sitting in the curule chairs, waited the approach of their enemies, and received their death in majestic silence. B., having plundered the city, now besieged the capitol for six months. During the beleaguerment occured the famous night-attack, which would have been successful had not the cackling of the geese, kept in Juno's temple, awakened the garrison. At length, however, the Romans were compelled to enter into negotiations with the besiegers. They offered 1000 lbs. of gold for their ransom, which was agreed to. According to Polybius, B. and his Gauls returned home in safety with their booty; but the rather mythical Roman traditions affirm that, just as the Gauls were leaving the city, Camillus, who had been recalled from banishment and appointed dictator, appeared at the head of an army, attacked them, and, in two bloody battles, slew the whole of the barbarians to a man.

Another B., who occupies a conspicuous place in history, was that Gallic chief who invaded Greece, 279 B.C., at the head of 150,000 foot and 61,000 horse. After desolating Macedonia, B. forced his way through Thessaly to Thermopylæ. The Grecian army fled at his approach. B. now rushed on with a division of his great host to Delphi, which he had resolved to plunder; but the Delphians having taken up a very advantageous position on some rocks, resisted his further progress. Assisted by the terrors of an earthquake and a terrible storm, besides, according to reverential tradition, by the supernatural help of Apollo, they utterly routed the Gauls, who fled in dismay. B. was taken prisoner, and drank himself to death in despair.

BRENTA (*Medoacus Major*), a river of n. Italy, rises from two small lakes in the Tyrol; flows first in a southern, then in an eastern course through the Venetian territory; passes the towns Cismona and Bassano; receives an arm of the Bacchiglione below Padua, where it becomes navigable; and falls into the gulf of Venice, at the haven of Brondolo. The ancient bed of the B. was, some centuries ago, altered by the Venetians, who feared that their lagoons might be choked with sand by its floods. Afterwards, the old bed of the river was made use of as a canal, the *Naviglio di Brenta Magra,* which forms the chief communication by water between Venice and Padua, while the B. is but little used for navigation.

BRENTA'NO, CLEMENS, known as a novelist and dramatic poet, and as the brother of Goethe's "Bettina," was born at Frankfort-on-the-Maine, 1777. He studied at Jena, and afterwards resided successively at Frankfort, Heidelberg, Vienna, and Berlin. In 1818, through a morbid discontent with himself and his fellow-men, he retired to the cloister at Dülmen, in Münster. Latterly he resided at Regensburg, Munich, and Frankfort-on-the Maine, where he led the life of a recluse, and gained a considerable reputation on account of his sarcastic wit. He died at Aschaffenburg, on the 28th of June, 1842. In his earliest poems the peculiarities of the "romantic school" of his time are carried to excess. His dramatic productions, such as *The Merry Musicians, a Musical Drama* (Frankfort, 1803), in which there are some gems of lyric poetry; *Ponce de Leon* (Göttingen, 1804), etc., are characterized by great dramatic power, amusing though rather far-fetched wit, and a wonderful flow of humor. Perhaps his most successful piece as a drama, is *The Founding of Prague* (Pesth, 1816). B. was most successful in his smaller novels, particularly in the *History of Caspar the Brave and the Fair Annerl* (2d edit. Berlin, 1831), which German critics call a "*chef-d'œuvre* in miniature." His last work, the legend of *Gokel, Hinkel, and Gakeleia* (Frankfort, 1838), was intended as a satire upon the times in which he lived. He has received the grateful acknowledgment of his countrymen for his renovation of the good old history of George Wickram, of Kolmar, which he published under the title of *The Thread of Gold* (*Der Goldfaden,* Heidelb., 1809).

BRENT'FORD, the co. t. of Middlesex, on both sides of the Brent, at its confluence with the Thames, 7 m. w.s.w. of London, and where the Thames is crossed by a bridge

leading to Kew. It consists chiefly of one long irregular street. Pop. '81, 11,808. It has large gin-distilleries, a soap-work, and the works of the West London water company. There are many market-gardens in the vicinity. Here Ironside defeated the Danes in 1016, after expelling them from London; in 1558, six martyrs were burned at the stake; and in 1642, the royalists, under Rupert, defeated the parliamentarians under col. Hollis.

BRENT GOOSE, or BRENT BARNACLE. This bird has been already noticed under BARNACLE (q.v.). We add here a few sentences from col. Hawker's *Instructions to Young Sportsmen*, which we borrow from Yarrell's *British Birds.* They refer to wild-fowl shooting on the coasts of Dorsetshire and Hampshire. "Towards Nov. or Dec., we have the Brent geese, which are always wild, unless in very hard weather. In calm weather, these geese have the cunning, in general, to leave the mud as soon as the tide flows high enough to bear an enemy; and then they go off to sea, and feed on the drifting weeds. To kill Brent geese by day, get out of sight in a small punt, at low water, and keep as near as possible to the edge of the sea. You will then hear them coming like a pack of hounds in full cry, and they will repeatedly pass within fair shot, provided you are well concealed, and the weather is windy to make them fly low. Before you fire at them, spring suddenly up, and these awkward birds will be in such a fright as to hover together and present a mark like a barn-door."—The extensive muddy and sandy flats between Holy island and the coast of Northumberland are a great winter resort of this species. It is also particularly abundant on muddy and sandy flats in Cromarty bay. The markets, both of London and Edinburgh, are well supplied with it during winter. The B. G. is known in some parts of England as the black goose; it is considered the most delicate for table of all its tribe, and is perhaps as much sought after as any. The B. G. differs in its habits from the common gray lag and several other species, inasmuch as it never feeds on fresh-water herbage, its tastes being exclusively salinous. B. G. may be distinguished, when on the wing, by their black bodies and white tails. Folkhard, in his excellent work, *The Wild Fowler*, gives much interesting information regarding this bird.

BRENTON, EDWARD PELHAM, 1774–1839; a capt. in the British navy. He wrote a *Naval History of Great Britain, from* 1783 *to* 1822. He was the founder of the Children's Friend Society.

BRENTON, WILLIAM, d. Newport, R. I., 1674; an emigrant from England, who held important offices in the colonies of Massachusetts and Rhode Island, being governor of the latter, 1666–69.

BRENZ, JOHANN, 1499–1570; a German reformer under Luther; a writer of great ability and popularity. One of his teachings was that the body of the Lord is everywhere present; hence his followers were called "Ubiquitarians."

BRESCIA, or BRESCIANO, a province in Lombardy, Italy, separated from Verona by Lago di Garda; 1784 sq.m.; pop. '71, 456,023. The n. part is occupied by a chain of the Rhætian Alps; the remainder, about two thirds of the province, is a part of the great and fertile plain of Lombardy. The rivers are the Oglio, the Mella, and the Chiese, tributaries of the Po. Corn, flax, hemp, grapes, and olives are cultivated. The mountains yield iron, copper, marble, alabaster, and granite. There are manufactures of silk, wool, cotton, linen, iron, steel, copper, glass, and paper. The chief towns are Rovato, Chiara, Orzinnovo, Monte-Chiaro, Salo, and Pontevico.

BRESCIA, a city of Italy, capital of the province of the same name, in Lombardy, about 60 m. e.n.e. of Milan. It is romantically situated on the rivers Mella and Garza, in a wide fertile plain, at the base of several hills. The railway from Milan to Venice passes through Brescia. The city is for the most part regularly built, and, besides two cathedrals, the old and the new, it has numerous ancient churches, adorned with pictures and frescos, including many by masters of the Venetian school. Several interesting antiquities have been discovered. It has a valuable public library, the *Biblioteca Quiriniana,* founded and nobly endowed about 1750, by cardinal Quirini, a munificent encourager of literature. It contains upwards of 30,000 volumes, with many rare manuscripts. The pop. in 1881 was 43,354. B. has manufactures of woolen, silk, leather, paper, etc., and its wine is of good quality. The old name of B. was *Brixia,* and its inhabitants were allied with the Romans when Hannibal crossed the Alps. It was captured by the Huns during their migrations, and afterwards passed through the hands of the Longobards, Charlemagne, the Franks, and the Germans. It was taken by the French under Gaston de Foix, in 1512, when it is stated that more than 40,000 of the inhabitants were massacred. The city never fully recovered from the effects of that inhuman sack and pillage. In Mar., 1849, B., as the only important town opposed to Austrian rule in Lombardy, was besieged by Haynau, and forced to capitulate.

BRESLAU, the capital of the province of Silesia, Prussia, is situated at the confluence of the Ohlau and Oder. Next to Berlin, it is the most populous city in Prussia; its pop. was 207,997 in 1871; and in 1880, 272,390, more than the half of whom are Protestants. The Oder divides it into two parts, which are connected by numerous handsome bridges. The fortifications have been converted into beautiful promenades, and the ditch has been transformed into an ornamental sheet of water. The streets of the new portion of

B. are spacious and regular, and the houses stately and handsome, affording a pleasant contrast to the somber, massive structures of the old town. Educational institutions are numerous, including a university founded by the emperor Leopold I. in 1702, and now accommodating from 900 to 1000 students. The library contains 300,000 volumes. B. has many churches, the most remarkable being the Protestant church dedicated to St. Elizabeth, with a steeple 364 ft. in height (the highest in Prussia), and a splendid organ. The position of B., in the center of the manufacturing districts of the province, secures it a large trade, which its railway connection with all the important cities on every side, in addition to the facilities of communication which the Oder affords, enables it to turn to the best account. It has manufactures of linen, woolens, cotton, silks, lace, jewelry, machines, earthenware, soap, alum, starch, etc., and upwards of 100 distilleries; and a trade in corn, coal, metals, timber, hemp, and flax. B. is a city of Slavonic origin, and was for many centuries occupied alternately by the Poles and the Bohemians. It afterwards passed to Austria, from which it was taken by Frederick II. of Prussia, in 1741. Six years afterwards, it was captured by the Austrians, after a bloody battle, but retaken by Frederick in about a month. From that time until 1814, when its fortifications were completely demolished, it was frequently besieged.

BRESSA'NI, Francesco Giuseppe, 1612–72; a Jesuit missionary among the Indians of Canada. In 1644, he was sent to the Huron country, but was captured and tortured by the Iroquois. After great suffering he was sent to the Dutch settlements at Albany, where he was ransomed for a large sum. He returned to France, but came back to missionary work and labored many years among the Hurons.

BRESSAY, one of the Shetland isles, e. of the Mainland, and separated from Lerwick by Bressay sound. It is 6 m. long and 2 broad, and is composed of Devonian rocks. It supplied Lerwick with peat, until the proprietor, fearing that the peat might be exhausted, stopped exportation; and it continues to supply the Shetland isles with slates. Pop. '71, 878, chiefly fishermen. Bressay sound is one of the finest natural harbors in the world, and is a rendezvous for herring-boats, and for all whalers and other vessels proceeding north. East of B., and separated from it by a narrow and dangerous sound, is a rocky isle, called Noss, 6 m. in circuit, girt on all sides by perpendicular cliffs, and rising abruptly from the sea to the height of nearly 600 ft., with a flattish top. A detached rock, or holm, on the s.e. side of the Noss, used to be communicated with by means of a cradle or wooden chair run on strong ropes, stretched across a yawning gulf, and admitting a man with a sheep to be drawn over at a time.

BREST, a strongly fortified city, in the department of Finistère, France, and one of the chief naval stations of the empire, is situated in lat. 48° 24′ n., and long. 4° 29′ w., on the n. side of the bay or road of Brest, which forms one of the finest harbors in the world. The only entrance to the bay is by a narrow channel called *Le Goulet*, which is scarcely a mile wide, and is strongly defended by batteries; the difficulty and danger of access to hostile ships being increased by certain rocks in the center of the channel. A new floating dock, quays, and pier were completed in 1876, at a cost of 22,500,000 francs. The small river Penfel flows through the town, which is, on the whole, irregularly built on an uneven site, and has steep, narrow, dark, and very dirty streets. In some parts communication between the lower and upper parts of the town can be effected only by stairs. The new quarter, the parade, and the quays, are more cleanly. B. has extensive ship-building yards, rope-walks, store-houses, etc.; its industry, indeed, is confined entirely to the equipment of the navy in its various branches. It has telegraphic communication with America by a submarine cable. The Bagnes (q.v.) or bulks no longer exists, the prisoners having been removed to the penal colony of Cayenne. Pop. '76, exclusive of garrison, 66,828. B. is a very ancient place, but it was not of much importance until the 17th century. Its splendid position made it an object of contention to French, English, and Spaniards. In 1631, Cardinal Richelieu resolved to make it a naval station, and commenced the fortifications, which were completed by Vauban, but have since been greatly extended. In 1694, the English under lord Berkeley were repulsed here with great loss. In 1794, the French fleet, under admiral Villaret-Joyeuse, was defeated off B. by the English fleet under admiral Howe.

BREST-LITOVSK, a t. in the government of Grodno, Russia, 131 m. s. of Grodno, in 52° 5′ n. and 23° 27′ e., at the junction of the Mukhovetz and the Bug. It is the seat of an Armenian bishop, who has authority over the Armenians in all the country. It has a varied and extensive trade, by means of the two rivers and the royal canal, in grain, flax, hemp, birch-tar, leather, etc. Pop. '67, 22,493.

BRETAGNE, or Brit'tany (*Britannia Minor*), a peninsula in the n.w. of France, formerly a province, and now divided into the departments of Finistère, Côtes-du-Nord, Morbihan, Loire-Inférieure, and Ille-et-Vilaine, is surrounded by the sea on the n.w. and s.w. Though the height of the mountains is nowhere considerable, their structure gives to the peninsula a wild and savage aspect. Clay-slate forms the center of the country, and masses of granite rise in the n. and the south. The climate is often foggy, and subject to violent storms of wind. Large tracts of land lie uncultivated; but in the well-watered valleys, vegetation is luxuriant. In ancient times, B., under the name of

Armorica, was the central seat of the confederated Armorican tribes, who were of Celtic and Kymric origin. Traces of them still remain in the old Kymric dialect of the three most westerly departments, and in the numerous so-called Druidical monuments. The name *Armorica* was changed for that of B., in consequence of the numerous immigrations from Great Britain in the 5th and 6th centuries. The peculiar, shut-in situation, and the characteristics of soil and climate in B., seem to have had a powerful effect on the character of its people. The Breton has generally a tinge of melancholy in his disposition; but often conceals, under a dull and indifferent exterior, a lively imagination and strong feelings. "The tenacity with which the Breton clings to the habits and belief of his forefathers, is apparent by his retention of the Celtic language almost universally in Basse B., and by his quaint costume, which in many districts is that of the 16th century." The greater number of the people are found to be ignorant and coarse in their manners, and their agriculture is of a very rude character, by no means calculated to develop the natural resources of the country. Until within recent years, B. had escaped the observation of tourists; but it has now been found out, and seems likely to be considerably run upon, as well as to have a pretty extensive literature of its own. It will be some time yet before it is exhausted, and apart from the beauty of its scenery, it possesses great interest, as the only place where men can be seen living and acting much as our forefathers did three centuries ago. Under the Romans, the country, after 58 B.C., was made the *Provincia Lugdunensis Tertia;* but its subjugation was hardly more than nominal, and it was entirely liberated in the 4th c., when it was divided into several allied republican states, which, afterwards, were changed into petty monarchies. B. became subject to the Franks in the reign of Charlemagne, and was handed over by Charles the simple to the Northmen in 912. After some fierce struggles, the Bretons appear to have at length acknowledged the suzerainty of the Norman dukes. Geoffroi, count of Rennes, was the first to assume the title of duke of Bretagne in 992. The duchy of B. was incorporated with France in 1532, by Francis I., to whom it had come by marriage, and subsequently shared in the general fortunes of the empire, but retained a local parliament until the outbreak of the revolution. During the revolution, B., which was intensely loyal, was the arena of sanguinary conflicts, and especially of the movements of the Chouans (q.v.), who reappeared as recently as 1832. Daru, *Histoire de B.* (Par. 1826); Roujoux, *Histoire des Rois et des Ducs de B.* (Par. 1829); Courson, *La B. du* 5e *au* 12e *Siècle* (1863); Le Saint, *La B. Ancienne et Moderne* (1873); De Kerorguen, *Recherches sur les Etats de B.* (1875).

BRETHREN, WHITE, a sect of the 15th c. that sprang up in the Italian Alps. Their leader claimed to be Elias the prophet; they were clad in white, and carried crucifixes from which blood appeared to come. The leader, who appears to have left no name, prophesied the destruction of the world, and for a time had great success; but Boniface IX. seized the prophet and burnt him at the stake, and within a year the sect passed out of existence.

BRETHREN AND CLERKS OF THE COMMON LIFE, or OF THE COMMON LOT. See BROTHERHOODS, RELIGIOUS, *ante.*

BRETHREN AND SISTERS OF THE FREE SPIRIT, or SPIRITUALISTS. See BEGUINES, *ante;* and BROTHERHOODS, RELIGIOUS, *ante.*

BRETHREN OF THE CHRISTIAN SCHOOLS, an order established at Rheims in 1679, and sanctioned by Benedict XIII. in 1725, having for its object furnishing the poor with instruction. In Paris, in 1792, they refused to take the oath of obedience to the civil constitution, and were driven from their houses and prohibited from teaching. In 1801, they returned and soon spread over France, Italy, and other countries. About 1830, they opened evening schools for adults. Their chief house is in Paris, and in 1868 they had more than 10,000 brethren, teaching 300,000 persons in France alone. There are a number of them in the United States.

BRETHREN OF THE HOLY TRINITY, a society of the 12th c., in France, whose members were pledged to give a third of their revenues towards the redemption of Christians who were in Mohammedan or infidel slavery.

BRETIGNY, a village of France, in the department of the Eure-et-Loir, about 6 m. s.e. of Chartres, on the railway between Paris and Orleans. B. is celebrated as the place where, in 1360, Edward III. concluded a peace with France, by which John II. of France was released from his captivity in England, on agreeing to pay 3 million crowns for his ransom. England renouncing her pretensions to Normandy, Anjou, Maine, and Touraine, and being confirmed in her possession of Gascony, Guienne, and several other parts in France recently acquired by conquest.

BRETON, EMILE. See page 877.

BRETON, JULES ADOLPHE, a French painter of the present day, excelling in rural life and scenes, for which he has received medals. Among his works are "The Gleaners," "Evening," "Blessing the Grain," "The Weeders," etc.

BRETON DE LOS HERREROS, Don MANUEL, the most popular of modern Spanish poets, was b. 19th Dec., 1800, at Quel, in the province of Logroño; received his earliest education in Madrid; and served as a volunteer in the army from 1814 to 1822. Subsequently, he held several situations under government, but always lost them on account of his expression of liberal opinion. As early as his 17th year, he wrote a comedy,

entitled *A la Vejez Viruelas*, which, in 1824, was brought upon the stage with great success. Henceforward he furnished theatrical managers with more than 150 pieces, partly original, partly adaptations from the older Spanish classics, and partly translations from the Italian and French, most of which have been highly popular. In addition to these, Breton de los Herreros published *Poesías Sueltas* (Madrid, 1831, and Paris, 1840); several volumes of satirical verse; a long humorous poem, called *La Desvergüenza, Poema Jocoserio* (Madrid, 1858), etc. All Breton de los Herreros's poems are remarkable for their singularly sweet, yet powerful diction, and for the harmony of the versification. His peculiar sphere is the comic and the satirical, in which the Spanish or national qualities of his genius find their freest expression, and in which also he displays most ease and self-reliance. Breton de los Herreros superintended the issue of a collected edition of his poetical works in 1850–52 (5 vols., Madrid). He died at Madrid in Nov., 1873.

BRETSCHNEIDER, Heinrich Gottfried, a man remarkable for his unsettled life, eccentric habits, and satirical writings, was b. at Gera, Mar. 6, 1739. He was first sent for education to the institute of Herrnhuters at Elbersdorf, and afterwards to the gymnasium at Gera. He became capt. of horse in a Prussian volunteer corps, in which service he was made prisoner, and retained in a French fortification till 1763. In 1775, B. visited England, France, and Holland; and in 1778 was nominated librarian to the university of Ofen, where he was persecuted by the Jesuits, whose hatred he had excited. This circumstance brought him under the notice of Joseph II., who, in 1782, appointed him one of the inspectors of studies. He died in Nov., 1810. B. was the author of tales, poems, and satires. The latter are attacks upon every kind of injustice and falsehood. In his "Almanac of the Saints (*Almanach der Heiligen*) for the year 1788, with copper-plates and music, printed at Rome, with the permission of the principals," the priesthood is severely attacked, and the legends of the monks ridiculed. Like Nicolai, B. was very bitter against the "Werther" mania which was so prevalent in his time.

BRETSCHNEIDER, Karl Gottlieb, a distinguished German theologian, b. 11th Feb., 1776, at Gersdorf, in Saxony, studied theology at Leipsic, was appointed pastor at Schneeberg in 1807, general superintendent at Gotha in 1816, and in 1840 obtained the dignity of a councilor of the upper consistory. He died 22d Jan., 1848. B. has acquired a reputation for sober, reflective, rationalistic thought. The character of his intellect rendered him unable to enter into the profound speculations of men like Schleiermacher and Schelling; but nevertheless, by his diligence, clear, incisive understanding, and strength of character, he has secured a permanent place in the history of German theology. His most important work in dogmatics is the *Manual of the Evangelical Lutheran Church* (2 vols., Leip. 1814–18). In 1824, B. published *Lexicon Manuale Græco-Latinum in Libros Novi Testamenti* (2 vols., Leip. 1824). In 1832, appeared *Der Simonismus und das Christenthum;* in 1835, *Die Theologie und die Revolution.* B. also published many sermons, which have been well received, and in other departments of theology and literature he is considered to have done important service.

BRETT, Philip Milledoler, d.d., 1817–60; b. New York; a graduate of Rutgers college; ordained in the Dutch Reformed church in 1838, and held pastorates in various places near New York. A volume of his sermons is in print.

BRETTEN, a t. of Baden, about 13 m. e. of Carlsruhe, chiefly noteworthy as the birthplace of Melanchthon. The house in which he was born is pointed out to travelers. Pop. '71, 3433; '80, 4034.

BRETTS AND SCOTS, The Laws of the (Lat. *Leges inter Brettos et Scotos*, old Fr. *Lusage de Scotis et de Bretis*), the name given, in the 13th c., to a code of laws in use among the Celtic tribes in Scotland. The "Scots" were the Celtic people dwelling in the western and more mountainous districts n. of the Forth and the Clyde, who, when it became necessary to distinguish them from the Teutonic inhabitants of the low country, received the names of "the wild Scots," "the Irishry of Scotland," and, more recently, "the Scotch highlanders." The "Bretts" were the remains of the British or Welsh people, who were at one time the sole or chief inhabitants of the region now divided into the shires of Dumbarton, Renfrew, Ayr, Lanark, Peebles, Selkirk, Roxburgh, Dumfries, and Cumberland. This province was for some centuries an independent kingdom, known by the names of "Cambria," "Cumbria," "Strathclyde," and "Strathclyde and Reged." It became, about the middle of the 10th c., a tributary principality held of the king of the English, by the heir of the king of the Scots. It so continued till after the beginning of the 12th c., when Cumberland having been incorporated with England, the gradual absorption of the rest of the territory into the dominions of the king of the Scots seems to have been imperceptibly completed. The last "prince of Cumbria" named in record was the brother and heir of king Alexander I. of Scotland, "the earl David," as he was called, who, on his brother's death in 1124, himself became king of the Scots. No more is heard of Cumbria as a principality; but "the Welsh" continue to be named among its inhabitants, in the charters of king David's grandsons—king Malcolm the maiden (1153–65), and king William the lion (1165–1214). And they seem to have retained more or less of their ancient Celtic laws until after the

beginning of the 14th century. It was not till the year 1305 that an ordinance of king Edward I. of England, who appeared then to have redueed all Scotland to his subjeetion, decreed "that the usages of the Seots and the Bretts be abolished, and no more used." It is unknown how far this prohibition took effect. Of the code whieh it proscribed, only a fragment has been preserved. It was first printed by sir John Skene, in his *Regiam Majestatem* (Edin. 1609). But by far the best edition is that of Mr. Thomas Thomson and Mr. Cosmo Innes, in the *Acts of the Parliaments of Scotland*, vol. i. pp. 299–301 (Edin. 1844), where the laws are given in three languages—Latin, Freneh, and English. The French version, whieh is the oldest, is printed from a manuscript of about 1270, formerly in the public library at Bern, in Switzerland, now in the register house at Edinburgh. The fragment of the "laws of the Bretts and the Scots" thus published, is of much the same nature as the ancient laws of the Anglo-Saxons, the Welsh, the Irish, and other nations of Western Europe. It fixes the *cro*, or price at whieh every man was valued, according to his degree, from the king down to the churl, and which, if he were slain, was to be paid to his kindred by the homicide or his kindred. The cro of the king was 1000 cows; of the king's son, or of an earl, 150 cows; of an earl's son or of a thane, 100 cows; of a thane's son, 66⅔ cows; of the nephew of a thane, or of an ogthiern, 44 cows and 21⅓ penee; and of a villain or churl, 16 cows—all persons of lower birth than a thane's nephew, or an ogthiern, being aceounted villains or churls. The cro of the married woman was less by a third than the cro of her husband. The cro of the unmarried woman was as mueh as the cro of her brother. Other chapters fix every man's *kelchyn* or *gelchach*, *gallnes*, and *enauch*—Celtie terms not yet satisfactorily interpreted, but apparently equivalent to the *fyhtwite*, *mund*, and *manbot* of the Anglo-Saxon, as the *cro* of the Bretts and Scots appears to answer to the *wergild* of the English. A chapter "of blood-drawing"—corresponding with the *blodwyte* of the Anglo-Saxons—fixes the fine to be paid for a blow to the effusion of blood, according to the degree of the person wounded and the place of the wound.

BREUGHEL, the name of a famous family of Dutch painters.—Peter B., the head of the family, was b. in the village of B., ncar Breda, in 1510 (or, as others say, 1530), and d. at Brussels in 1570 or 1590. He was a scholar of Peter Koeck van Aelst, traveled through Italy and France, and on his return, fixed his residence at Antwerp. He painted chiefly the pleasures of rustic life, for whieh he himself had a great relish, and whieh he transferred to his canvas with clear insight and vivid coloring, though unnecessarily exceeding at times the coarseness of his subject. He also executed several historieal pieces, such as his "Building of the Tower of Babel," now preserved in the gallery at Vienna.—His son, Peter B., distinguished by the strange title "Hellish Breughel"—because he loved to paint scenes in whieh the leading characters were devils, hags, robbers, etc.—was b. about 1569, and d. 1625. His paintings of "Orpheus" and the "Temptation of St. Antony" are the most remarkable of his pieces.—Jan B., brother of the preceding, and on aceount of the splendid apparel which he wore when he became rich, usually ealled Velvet B., was b. 1568 or 1575, and d. 1625 or 1640. He was an industrious painter, distinguished for his landscapes and for his minute finish of small figures. In concert with Rubens, who supplied the two chief figures, he painted "Adam and Eve in Paradise," and "Vertumnus and Bellona." These, with the "Four Elements," are his ehief works.—Other members of the same family were known as painters: Ambrose B., director of the aeademy of painting, Antwerp, between the years 1635 and 1670; Abraham B., a painter of fruits, flowers, and birds, lived long in Rome and Naples, where he d. in 1690; Jan Baptist B., b. in Rome, d. 1700; and finally, Caspar B., both of whom were flower-painters.

BREVARD, a large co. in s.e. Florida, on the Atlantic ocean; 5600 sq.m.; pop, '80, 1478. It is low, flat, and full of lakes and marshes. Along the coast is Indian river, an inlet of the oeean. There is little cultivation and there are no large villages.

BREVE. See Ant-catcher.

BREVE, a note in music, which, in the old notation of Guido d'Arezzo, had the value of two whole bars. It is written thus,  , or  , or  . The note for a whole bar in modern notation is called semibreve, and has the value of four crotehets. In triple time, the B. contained three semibreves. The B. is now only used in *a la capella* movements, psalm-tunes, and fugues, or at the close of a composition.

BREVE, or Brieve, in the practice of the Scotch law, is a writ issuing from chancery in the name of the crown, to a judge, ordering him to try by jury the points or questions stated in the breve. In ancient times, these writs appear to have been the foundation of almost all eivil actions in Scotland; but they are now only used in the following cases: 1. B. of inquest, now, however, superseded by a petition of service, according to the 10 and 11 Vict. c. 47. The object of the proceeding is judieially to ascertain the heir of a deceased person. 2. B. of tutory, the purpose of which is the appointment, as guardian to a pupil, of the nearest agnate or person most nearly related through the father. 3. Breves of idiotry and furiosity, by which the mental condition of a party may be determined for the appointment, in case of ascertained insanity, of a guardian or curator. In the B. of idiotry, the direetion is to inquire whether the person is of unsound mind, furious, and naturally an idiot. In the breve of furiosity, it is whether

he be of unsound mind, prodigal, and furious. 4. B. of terce. The object of this writ is to "cognosce the widow to her terce"—that is, to enable her to recover her terce or dower. It is issued to the sheriff of the county, and the jury under his presidency are directed to inquire whether the claimant was the lawful wife of the deceased, and whether the husband died infeft in the lands from which the terce is claimed. The verdict of the jury gives the widow her terce, and the judge then "kens" her to it. See TERCE, and KENNING TO THE TERCE. 5. B. of division amongst heir-portioners. By means of this B., an heir-portioner—that is, one of two or more sisters succeeding in equal portions to a landed estate—may have her share of the lands separated or set apart by a judge, who appoints an inquest, or jury of fifteen persons, to measure the land, and make a division; the jury report to the judge; and lots being cast for the different shares, the judge decides accordingly. The form is, however, now seldom used, an arbitration being more generally resorted to. See INHERITANCE, SUCCESSION, HEIRS-PORTIONERS.

BREVET' (Fr. a writ or warrant), in the British army, is a promotion of officers, now strictly limited in its application, but before 1854 a recognized though occasional mode of conferring a large measure of general promotion throughout the army. It took place under various circumstances. If no special cause interfered, a general promotion by B. used in former times to be made once in about six years; but in more recent years it was limited to very special occasions, as a coronation, the birth of an heir to the throne, the termination of some great war, etc., and was limited to officers who had some particular claim to promotion. The officers so promoted obtained an increase of rank, and in some cases pay, even if they had never served in the field. A B. was determined on by the cabinet, and carried out by the commander-in-chief. The officers expected it, as one of the implied conditions on entering the service, and it had formed part of the British military system ever since the time of James II.; but it was unsatisfactory, because the flow of promotion caused by it was arbitrary, uncertain, and much liable to abuse. There were brevets, arising out of the various circumstances above indicated, in 1837, 1838, 1841, 1846, 1851, and 1854. On these occasions, lieut.-generals, maj.generals, colonels, lieut.colonels, majors, and captains received a promotion of one grade in rank. On one of these occasions, 200 colonels were at once made maj.generals. The higher the rank, the higher the pay, as a general rule; and therefore the cost to the nation is always increased for a time after each brevet. Thus the B. of 1837 occasioned an annual increase of £11,000; that of 1838, £7000; of 1841, £15,000; of 1846, £21,000, etc.; but it must not be forgotten that death and sales had in the intervals cleared off perhaps an equal number of officers at the higher rates of pay. In 1854, the new maj.generals alone involved an additional charge of £18,000 a year.

The above description applied before 1854. In that year, general brevets were abolished—a fixed establishment of general officers being substituted. The only brevets now are obtained by service of five years as lieut.col. (making the officer brevet col., without increase of pay); by distinguished service in the field, applicable to lieut.colonels, majors, and captains (carrying the substantive pay of the higher rank, except in the case of the lieut.col.); and by succession, when a death occurs among the establishment of general officers. In this last case there is no brevet promotion to the rank of col., but the senior maj. in the whole army and marines becomes a brevet lieut.col. without increase of pay, and the senior capt. a brevet-maj. with 2*s.* a day extra. Officers become maj.generals, in accordance with their seniority as brevet colonels, and it will be seen, from the above description, that the brevet rank of col., which is the stepping-stone to maj.gen., is obtainable *by service only*.

Other matters having reference to this subject will be found treated under the article COMMISSIONS, ARMY.

As brevet rank was neither purchasable nor salable, the abolition of the purchase-system made no alteration.

There is no B. promotion in the navy.

BREVET (*ante*), in the U. S. army, a commission giving an officer a nominal rank higher than that for which he has a salary. A great number of these honorary titles were bestowed during and after the civil war.

BREVIA'RIUM ALARICA'NUM, a collection of Roman laws compiled by order of Alaric II., king of the Visigoths, in 506 A.D. The chief value of this compilation is that it preserves the first five books of the Theodosian code and five books of the *Sententiæ Receptæ* of Julius Paulus, which are nowhere else found.

BREV'IARY. By this title we are to understand an *abbreviation*, as well as an amended arrangement of the more ancient offices used at the seven canonical hours, which are matins, prime, tierce, sext, nones, vespers, and compline. See CANONICAL HOURS. The books in which these offices were contained were formerly distinct—viz.: 1. The *Psalter*, which included the Psalms of David according to St. Jerome's Galbian version, the Te Deum, the Athanasian creed, etc.; 2. The Bible; 3. The *Antiphonarium*, containing the anthems and responsories; 4. The *Hymnarium;* 5. The *Collectarium*, or the collects to be said at the end of the services; 6. The *Homilarium, Passionarium*, and

Martyrologium, containing the comments of the fathers upon the gospel of the day, and accounts of the martyrdoms of the saints for each distinct festival. Out of all these separate books, the B. was compiled, about the 11th c., by pope Gregory VII., as is supposed; the lessons, anthems, hymns, and responsories for the different days of the year being all arranged, in their proper places, in the same volume with the psalter, prayers, etc. In later times, the B. was divided into two parts, one for each half of the year, as was the case with those of Salisbury, York, and Hereford, used in England; and afterwards into four parts, so as to be more portable, whence it was also called *Portiforium*. It may perhaps be necessary to inform our Protestant readers that the B. is an entirely distinct book from the Missal (q.v.), the latter containing the proper offices for the service of the sacrifice of the mass.

The last settlement of the B. was under the pontificate of Pius V., and his bull of 1568 was that by which the present daily office of the Roman church is authorized. This edition was compiled by the college of sacred rites at Rome, in conformity with the decrees of the council of Trent, because of the variety of *uses*, as they were called, which at that time existed in different dioceses. The bull of Pius V. abolished the use of all breviaries, except such as could prove a prescription of 200 years. This exception would have extended to the breviaries of Salisbury and York, if the church of England had not already thrown off Rome's supremacy, and compiled a new book of common prayer for herself. After this, in 1602, Clement VIII. had a standard edition printed at the Vatican, to which all future editions were to conform; and again, in 1631, Urban VIII. caused the meters of the hymns and the Latinity of the whole to be carefully revised. It is perhaps hardly necessary to state that the B. is in Latin, portions of it being sometimes translated for the use of the unlearned. Itis necessarily a very bulky volume, when complete; and although some of the legends of the saints and martyrs may be of doubtful authenticity, yet it is a mine of interesting and devotional reading. Its general contents may be judged of from what has been already stated as to the sources from which they were drawn, every saint in the calendar having his proper services for the different canonical hours. The festivals of the Roman church have their services, according to their importance, duplex, semi-duplex, or simplex—i.e., double, semi-double, or simple; these, again, are further distinguished, so that there are no less than 9 classes of services —the Ferial or ordinary week-day, the simple, the day with an octave, the semi-double, the dominical or Sunday, the double, greater double, double of the second class, double of the first class. Indeed, so elaborate and perplexing are the rubrical directions, that it is impossible to form any idea of them without consulting the B. itself, and there are probably but few of the priests who are thoroughly conversant with their own ritual.

The B. contains, besides an office for the dead and other smaller offices, three kinds of office in honor of the blessed Virgin Mary—viz.: 1. The full office, said on such festivals as the Purification, Annunciation, Immaculate Conception, Assumption, etc.; 2. the office of the Virgin Mary on Saturdays; 3. What is called the "little office," or the hours of the Virgin. This last was in use as early as the 7c., and was enjoined by the council of Claremont, 1096, to be said by the clergy daily, and by the laity on Saturdays, but the bull of Pius V. removed this obligation except as to clergy in choirs. The Roman church enjoins, under pain of excommunication, all "religious" persons—i.e., all persons, male or female, who have taken vows in any religious order—to repeat, either in public or private, the services of the canonical hours as contained in the breviary. For the influence of the old breviaries on the English common prayer-book (q.v.), consult Palmer's *Antiquities of the English Ritual*, and Maskell's *Monumenta Ritualia*. The matins or morning-prayer of the English prayer-book is an abridgment, with many omissions and additions, of the matins, lauds, and prime of the B., whilst the office of even-song, or evening-prayer, is in like manner an abridgment of the ancient vespers and compline.

BREVIPEN'NES (Lat. short-winged), in ornithology, according to the system of Cuvier, that tribe of the order *grallatores* (q.v.) in which the ostrich, cassowary, rhea or nandou, emu, and apteryx are comprised, and also the extinct dodo.—See these articles. The B. are characterized by a shortness of wing which incapacitates them for flight, but use their wings to aid them in running, which they do with great rapidity. Their *sternum* (breast-bone) has no ridge or keel. They constitute the family *struthionidæ* of many ornithologists, and by some are placed among gallinaceous (q.v.) birds, to which they are allied by the form of their bill and their choice of food. They are, however, very different from all other birds, and whether ranked among grallatores or gallinaceous birds, do not seem to form a natural part of the order. The gigantic *dinoris* (q.v.) and other fossil birds of great interest exhibit the characters of the *brevipennes*.

Gigantic birds, of which the footsteps appear imprinted on sandstones in the valley of the Connecticut and elsewhere, seem also to have belonged to this tribe. No remains or traces of such birds are, however, found nearly so ancient as many remains of quadrupeds. But to whatever geological period the commencement of their existence is to be referred, a peculiar interest is attached to them, because its close may be regarded as probably near. There is no tribe of birds that more generally shuns man, or disappears before the increase of population and the progress of colonization. The cassowary and the emu are rapidly becoming rare. The ostrich, the rhea, the apteryx, the notornis, etc., are only found in deserts or other deep solitudes.

BREVIPENNES, or BREVIPENNATES, meaning "short-winged," a term for such birds as the ostrich, cassowary, apteryx, and others having very short wings, not fitted for flying. Such birds usually live in solitary places or deserts.

BREWER, a t. in Penobscot co., Me., on the Penobscot river, opposite the city of Bangor, on the Bucksport and Bangor railroad; pop. 3214. It has lumber and leather manufactories. Pop. '80, 3170.

BREWER, LEIGH RICHMOND, D.D. See page 877.

BREWING. For the process of B. see BEER. The legal requirements for the B. of beer for sale will be found in many acts of parliament, from the 12 Chas. II. c. 24, to 33 and 34 Vict. c. 32 s. 10, changes being of late frequent. Instead of licenses to brew, as formerly, duties are levied on the quantity of beer brewed, according to a scale which ranges from a quantity not exceeding 20 barrels to one that shall exceed 40,000 barrels, the duty itself beginning at 10*s.*, and rising up to £75, according to the quantity. In the case of that kind of beer called *table beer*, it is provided that the duty on such shall in no case exceed £2, no matter how large the quantity brewed may be. Brewers are not to retail or sell beer at any other place than their licensed B. premises, and if they wish to sell beer at other places, they must get a license for these places also; but it is provided that the taking orders for the sale of beer in any quantity amounting to or exceeding 4½ gallons, or two dozen reputed quart bottles at one time, sent to the purchaser direct from the B. premises, shall not be deemed a selling of beer at any other place. Several of the above acts (the 13 and 14 Vict.) contain provisions respecting the duties to be levied on sugar used in B., providing that such duties shall be at the rate of 1*s.* 4*d.* for every cwt. of sugar; and brewers are to make true entry, in the book kept for that purpose by the exeise, of the quantity of sugar, in pounds-weight avoirdupois, used in B., under a penalty of £200, over and above any other penalties to which they may be liable. The acts contain numerous other regulations, too minute for further detail here. See BEER, BEER ACTS, LICENSES.

Anciently, in Scotland, the privilege of B. was given by a license from the superior or lord, in whose deed of gift or charter to his vassals there was generally a clause *cum bruerïs*. But these forms have long been dispensed with. It appears, however, that a person with the right of barony may prevent a feuar, that is, a tenant of property within the barony or a stranger, from importing and vending ale within the baronial limits without his license.

BREWSTER, BENJAMIN HARRIS. See page 877.

BREWSTER, Sir DAVID, an eminent natural philosopher and eloquent writer, was b. at Jedburgh, Dec. 11, 1781. He was educated for the church of Scotland at the university of Edinburgh, where he highly distinguished himself. In 1808, he undertook the editorship of the *Edinburgh Encyclopædia*, to which he contributed many important scientific articles. Previous to this, he had entered deeply on the study of optics, with which his name is now enduringly associated. The beautiful philosophical toy, called the kaleidoscope, was invented by him in 1816. In 1819, in conjunction with prof. Jameson, he established the *Edinburgh Philosophical Journal;* and in 1831 he was one of the chief originators of the British association for the advancement of science. The honors conferred on this distinguished man make up a long catalogue. In 1815, he obtained the Copley medal of the royal society for one of his optical discoveries, and soon after was elected a fellow; in 1816, he received half the physical prize bestowed by the French institute for two of the most important scientific discoveries made in Europe during the two preceding years; in 1819, the royal society awarded him the Rumford gold and silver medals, for his discovery on the polarization of light; in 1825, he became corresponding member of the institute of France; in 1832, he was knighted, and had a pension conferred upon him; in 1838, he was chosen principal of the united colleges of St. Leonard and St. Salvador, St. Andrews; in 1849, on the death of Berzelius, in the preceding year, he was elected one of the eight foreign associates of the French institute, the highest scientific distinction in Europe. Sir David was also a member of the imperial and royal academies of St. Petersburg, Berlin, Copenhagen, and Stockholm; presided over the British association, and in 1851, over the peace congress held in London. In 1859, on the death of Dr. John Lee, he was chosen principal of the Edinburgh university. His principal work is his *Life of Newton*, first published in 1828, in the *Family Library*, and issued in a totally new and greatly enlarged form in 1855. Among his other works are his interesting *Letters on Natural Magic*, addressed to sir Walter Scott, also published in the *Family Library; More Worlds than One* (1854); his treatises on the kaleidoscope and on optics (*Cabinet Cyclopædia*); his *Martyrs of Science;* and his treatises in the *Encyclopædia Britannica* on electricity, magnetism, optics, the stereoscope, etc. Among other periodicals to which he contributed largely are the *Edinburgh* and *North British Reviews*. He died Feb., 1868. See *Home Life of B.* by his daughter, Mrs. Gordon (1869).

BREWSTER, WILLIAM, 1560-1644; b. England; one of the pilgrims who landed at Plymouth. He went with Bradford to Holland, where he taught school in English, became an elder in the church, and held the same position in New England, though, as he had never been ordained, he always refused to administer the sacraments. He is more generally known in history as "Elder Brewster."

BREZO'WA, a market t. of Hungary, in the co. of Neutra, on a river of the same name, about 19 m. n.w. of Leopoldstadt. It has a Roman Catholic church and a Protestant church, tanneries, and distilleries. Pop. '69, 5886.

BRIALMONT, Henri Alexis, b. 1821; a Belgian engineer and military writer, and member of various learned societies. He has published a number of works on the art and methods of military fortifications, on which he is accepted as one of the best authorities. He was made lieut.-gen., 1877.

BRIAN BOROIMHE (pron. *boru'*), a famous king of Ireland, ascended the throne of both Munsters—answering to the present counties of Tipperary and Clare—in 978. Some time afterwards, he deposed O'Maelachaghlin, and became supreme ruler of Ireland. The surname, Boroimhe, signifying tax, was given him in consequence of the tribute in kind he levied from the various provinces. King Brian supported a rude but princely state at his chief castle at Kincora, a place in the neighborhood of the modern town of Killaloe, and he had also seats at Tara and Cashel. The vigor of his reign brought prosperity to his country. He defeated the Danes in upwards of 20 pitched battles, restricting their influence to the four cities of Dublin, Wexford, Waterford, and Limerick alone. In the battle of Clontarf (1014), in which he was killed, he gained a signal victory over a united army of revolted natives and Danes, the power of the latter receiving a shock from which it never recovered.

BRIANCON (ancient *Brigantium*), a t. of the department of the Hautes-Alpes, France, on the right bank of the Durance, about 35 m. n.e. of Gap. It is the highest town in the French empire, being situated at an elevation of nearly 4300 ft. above the sea-level. As the principal arsenal and depot of the French Alps, B. is very strongly fortified, while several forts guard the approaches, and every height in the vicinity is a point of defense. It is considered impregnable. Troops can readily be marched from it on to the passes of the Simplon, St. Bernard, Mont Cenis, and the Col de Tende. Mont Genèvre affords a practicable passage into Italy from the town itself. B. has some manufactures of cotton-goods, hosiery, cutlery, crayons, etc. Pop. '76, exclusive of garrison, 2321.

BRIANSK', a t. of Russia, in the government of Orel, 70 m. w. of the city of that name. It is situated on the right bank of the Desna, is surrounded with earthen ramparts, and has a considerable trade in grain, hemp, wax, linen, cables, cordage, iron, etc., with Kherson, Odessa, and other ports on the Black sea. B. has a cannon-foundry and 13 churches. Pop. '67, 13,881; '80, 14,650.

BRIARE, a t. in the department of Loiret, France, situated on the right bank of the Loire, at the point where the canal de Briare enters that river, about 43 m. s.e. of Orleans. The canal, which unites the Loire and the Seine, is remarkable as the first that was constructed in France, having been begun by Sully, and finished in 1642. B. has a considerable trade in wine, wood, and charcoal. It is supposed to occupy the site of the ancient *Brivodurum*. Pop. '76, 3970.

BRIA'REUS, or Ægæon, one of the three sons of Uranus and Gaia; the others were Cottus and Gyges, and each of the three had a hundred arms. They assisted Zeus when the Titans made war against Olympus. One account represents B. as assailing Olympus and being defeated and buried under Mt. Etna. As B. is sometimes called a marine deity, it has been thought probable that the hundred arms symbolized the waves of the sea.

BRIBERY. The corrupt practices known by the term B. might well form the theme of an extended essay. Here we can point only to a few of the more conspicuous features of this grave social disorder, and chiefly as concerns B. at elections.

Election B., a well-known form of corruption, may be called the canker and disgrace of constitutional government. Individuals, with little to recommend them but wealth, and it may be some local distinction, wishing to be elected representatives in the legislature, do not scruple, through various devices, to buy the votes of the meaner order of electors by bribes. B. at elections is perhaps more openly and audaciously practiced in various parts of the United States than it is in England; nor are base influences of this kind unknown in connection with the more meager constitutional forms of some continental states. But in the eye of the world, England had the unenviable notoriety of being the country in which B. was reduced to a regular and continuous, though covert, system. It had been demonstrated by parliamentary inquiry, that masses of the population in certain towns—more particularly the class called freemen—look upon the franchise as a privilege which, for personal benefit, entitles them to exact so much money for their votes. Public considerations had no weight with them whatever. It seemed to them to be alike their duty and their interest to sell their votes to the highest bidder. The earl of Dundonald mentions in his *Autobiography*, that when, as lord Cochrane, he offered himself as a candidate for Honiton, he was barefacedly told by one of the electors, "that he always voted for Mister Most;" and not choosing to bribe, he lost his election. The amount of bribe ordinarily paid at elections in this venal class of boroughs, varied from £1 to £10, according to circumstances; as high a sum as £20, and even £50, had been known to be given in the extremities of a contest. For these corrupting and disgraceful practices, the law threatens certain penalties; but to avoid incurring these,

as well as for the sake of decency, the candidates employed a mean class of agents, or were in some obscure way assisted by confederates, of whose proceedings it was difficult to substantiate any guilty knowledge on their part. The agents more immediately concerned did the business of bribing in private, sometimes in darkened apartments, where no one could be seen. Formerly, the treating of voters in taverns was added to other varieties of corruption, and the demoralization that ensued on occasions of this kind amounted almost to a universal saturnalia. The law having interposed to check this gross form of B., the evil had latterly subsided into a common-place routine of secret money-dealings. Of course, by this illegal expenditure, along with the necessary outlays which the law allows, the cost of an election was in many cases enormous. Few seats of English borough members cost less than £1800; but double and triple this sum was a common outlay. It is a well-known fact, that for certain boroughs any man—no matter what be his political opinions or private character—might be returned by advancing £4000, and asking no questions as to what was done with it. As the B. was on both sides, it may be safely averred that the money spent at some contested elections amounted to £10,000. As regards elections for counties, the influences brought to bear are ordinarily of a different kind; but though morally wrong, they do not come within the scope of the present article. The Scotch have some reason to boast that their country is comparatively exempt from this social disorder—that their representatives are not so depraved as to offer, nor the electors so weak and needy as to accept, money-bribes. Such may be said as a general truth. Unfortunately, however, the national integrity is in this respect not quite unblemished, for the member returned for the Falkirk burghs, in 1857, was unseated for bribery. To avert every form of corrupt influence, the ballot (q.v.) was long vehemently urged; and an act to secure the use of the ballot in parliamentary and municipal elections throughout Great Britain and Ireland was finally passed in July, 1872. So far bribery seems to have been almost unaffected by the ballot act. The improved mode of trying election petitions by judges has worked well. See Corrupt Practices Act, and Parliament.

Bribery in Municipal Elections. By the corrupt practices (municipal elections) act, 1872, the offense of B. is put on the same footing as in parliamentary elections. The guilty person is forever disabled from voting at other municipal elections, and also from holding any office or franchise in the borough. See Municipality.

Bribery of Custom-house and Excise Officers. By the customs consolidation act, the 16 and 17 Vict. c. 107, s. 262, every person who shall give or offer any bribe, or make any collusive arrangement with any officer of customs or excise, or other person employed for the prevention of smuggling, in order to induce him to neglect his duty, shall forfeit the sum of £200. A former act, passed in 1827, the 7 and 8 Geo. IV. c. 53, s. 12, still in force, specially enacts in the case of the excise, that persons in such service taking money or reward, or entering into any collusive agreement contrary to their duty, shall for every such offense forfeit the sum of £500, and be incapable of serving the crown in any office or employment; and any person giving or offering money or reward to excise officers, in order to corrupt and prevail upon them, shall forfeit the like sum of £500, but simply and without any further penalty of disqualification.

Bribery of Judges. This offense in the old Scotch law was called Barratry (q.v.)

BRIBERY (*ante*), in general the same here as in England, and always a crime difficult to prove and more difficult to punish. It is defined as the receiving or offering any improper reward by or to any person, that may in any way relate to the administration of justice, or influence behavior in a matter of official duty, or lead the person to act contrary to the common rules of honesty and integrity. Nearly all the states have special statutes and severe penalties for the offense.

BRIC-A-BRAC. See page 877.

BRICK. The earliest examples of this branch of the ceramic art were doubtless the sun-dried bricks of Egypt, Assyria, and Babylonia. Remarkable to say, many of these, which, in a northern climate, the frosts of a single winter would destroy, have been preserved for some 3000 years by the dry, warm atmosphere of those countries. Sun-baked bricks of ancient date are also found in the mud walls of old towns in India. Kiln-baked bricks must have been the products of a later time; but they are found in all the chief ruins of ancient Babylonia, where they were often used to face or bind together walls of sun-dried bricks, and occasionally they were even ornamented with enameled colors. Burnt bricks were employed in the foundations of the tower of Babel (Gen. xi. 3). These ancient bricks, whether baked by the sun or by fire, were all made of clay mixed with grass or straw. The ancient Greeks, probably owing to their possessing plenty of stone, cared little for building with burned clay; but most of the great ruins in Rome are built of brick, and the Romans appear to have introduced the art into England. Interesting historical information has been obtained from the impressions on Roman and especially on Babylonian bricks. In many instances, the Roman bricks found in England have been removed from their original position, and employed in the construction of buildings of later date. The earliest instance in which bricks of the modern or Flemish make occur in England, is Little Wenham hall, in Suffolk, 1260.

Manufacture of Bricks.—Clay suitable for the manufacture of common bricks is an abundant substance, but there is a great difference in the nature and quality of the clays found in various localities. The basis of clay consists of hydrated silicate of alumina.

with a varying proportion of other mineral matters, chiefly free silica (sand), iron, lime, magnesia, and potash. Great advantage is derived from digging clay in autumn, and exposing it all winter to the disintegrating action of frost. This is not always attended to, but when neglected, the bricks made from it are apt to be unsound, and faulty in shape. The next process is that of tempering or mixing the clay into a homogeneous paste, which is sometimes done by the spade, but more commonly in the pug-mill (see article Pottery) or by crushing between a pair of rollers; often, indeed, both are employed. In making bricks by the old hand process, the shape is given by a mold either entirely of wood, or of wood faced with metal, and without top or bottom. This admits of the clay being pressed into it by a tool called a plane, which is also used to produce an even surface on the upper and lower beds of the brick, by working off the superfluous clay. Sand is used to part the wet clay from the mold and the table on which it rests.

Although hand-made bricks are still very common, yet machinery is now always employed when large quantities are required. Brick-making machines are of two leading kinds; one class of them being constructed to work the clay in a wet plastic state, the other class requiring it to be in a semi-dry condition. Of the two sorts, the wet-clay machines are the simpler, cheaper, and can be worked by less-skilled workmen. On the other hand, the dry-clay machines, which make the bricks by forcing the clay into molds by strong pressure, shorten the process, as no time is required for drying them. The bricks so made, too, are not only of a more perfect shape, but they can be molded into any form, and may even be made highly ornamental at a very slight additional cost.

As might be expected, both the dry and the wet-clay machines of different makers vary considerably in their details. The general plan on which most of the wet-clay machines work is as follows: The machine is driven by steam, and the clay is fed by a hopper into a pug-mill, on the central shaft of which strong pugging blades are placed in a spiral manner. These prepare and force the clay out at the bottom, whence it passes over the carrying rollers to the pressing rollers, which force it through a die in a rectangular stream, so exactly shaped to the required size that nothing more is necessary than to cut it into single bricks by wires. These are set in a rocking frame, which can be so adjusted as to cut the bricks on the square or at an angle; the one plan being adopted when the clay is at rest, the other while it is in motion. When double-ended, the clay is forced out at opposite sides of the pugging cylinder, and there is then, of course, a cutting-table at either side, instead of only one. Some of these machines are provided with a pair of powerful crushing rollers, which reduce any hard lumps or stones before the clay enters the pug-mill. One of the best known wet-clay machines is that made by Clayton, Son & Co., London. When of a size which can be worked by a steam-engine of 16-horse power, it produces from 20,000 to 30,000 bricks per day, and its price in 1871 was £330. Drain tiles are made by the same kind of machinery, with a peculiarly constructed die, so as to make clay into a hollow tube; so also are hollow bricks, with again an alteration in the shape of the die. Hollow bricks, having less body than those which are solid, are more easily and usually more thoroughly fired. On account of this, as well as by reason of their admitting of a current of air through them, they form, as a rule, dryer walls.

The green bricks, after being carefully dried, either in the sun or by artificial heat, are usually baked in a kiln with a suitable arrangement of fires and flues. Kilns are of many forms, and the time required for firing in them varies from 40 to 60 hours for common red and white bricks, while for some fire-bricks 150 hours are necessary. Where kilns are not used, bricks are burned in clamps, the clay requiring to be mixed up, in the process of tempering, with a quantity of ground coal sufficient to burn them. A good test of the character of a clay is obtained by the result of firing. The average contraction in the kiln for prepared clays is 7½ per cent. If a brick contracts much more than this, the clay is too fusible; if less, then it is likely to be of an open porous body, which retains its shape well during the firing process.

All brick clays contain iron, and the color of a burned brick almost entirely depends on the amount of it which is present; thus clays containing less than 1 or 1½ per cent of iron, change in the kiln to various shades of cream color and buff, whilst those containing more than 2 per cent, range in color from yellowish-fawn to dark red. Blue bricks are made from the same clay as the red, by controlling in a peculiar way the supply of air in firing, and by carrying the heat slightly further. It is asserted by some that the red is changed to the black oxide of iron in the process.

Fire-bricks are made from clay as free as possible from oxide of iron and alkaline substances, so that there may be no tendency to fuse in the kiln, however high the heat. Fire-clays are abundant in the coal-measures, some of fine quality being found about Newcastle and Glasgow, but the most celebrated is that of Stourbridge, which is exported to all parts of the world. See Fire-Clay.

Much attention has been paid of late years to the manufacture of fine bricks and terra cotta, which is only another name for ornamental bricks of various shapes, or architectural enrichments of the same material. The effect of some of the public buildings recently erected in London and elsewhere, in which terra cotta has been used, is really beautiful. Although it cannot be said to equal sandsone in appearance, it has

yet the advantage of giving a much greater variety of color, and is infinitely better and more enduring than a facing of stucco or cement.

The duties formerly levied on bricks were wholly repealed in 1850.

BRICK (*ante*), made in the United States in nearly the same manner as in England. The size varies in various sections from 7¾ to 8⅓ in. long, 4 to 4½ wide, and 2 to 2¼ thick, and is therefore smaller than that of English B., which are usually 9 by 4½ and 2½. Philadelphia pressed bricks are in great demand for outer or front walls in consequence of their perfection. Immense quantities of B. are made at Haverstraw and other places on the Hudson river. Excellent fire-brick are made at South Amboy, N. J.; at Athens, on the Hudson; at Chicago, Peoria, and other places. Milwaukee bricks have a pleasing yellowish cream color; and these, with others variously colored in the manufacture, find much favor for outer walls. Bricks are found to stand fire better than stone.

BRICKLAYING—BRICKWORK. The material of which a town is built depends mainly on the geology of the surrounding district. In a mountainous country like Scotland, cities of stone, such as Edinburgh, Glasgow, and Aberdeen, naturally abound; while London and most of the great towns of England, situated in alluvial valleys and plains, are built of bricks derived from the alluvial clay beneath and around them. In Holland, where the whole country is but the delta of the Rhine, and no stone is to be found, brick is universal, even to the paving of the streets.

The standard size of English bricks being 9 in. by 4½, the thickness of walls is regulated thereby. They are either half-brick, 1 brick, 1½, 2, 3, or 4 bricks in thickness. In moderate-sized modern English houses, the inside partition-walls are usually half-brick, the outer walls, 1 or 1½. In larger houses of superior construction, a thickness of two or three bricks is sometimes used. This latter thickness is seldom exceeded, except in large public works. Modern brick-houses are, for the most part, far less substantial than those erected by our forefathers. Building leases being usually granted for ninety-nine years, at the expiration of which term, the whole property reverts to the free-holder, the object of the builder is merely to make a house that shall stand for that period, and not to expend any money for the sake of further stability. Garden-walls are commonly built but half-brick in thickness; these, however, are strengthened by 9-in. piers at intervals of 10 or 12 feet. In laying the foundations of walls, the first courses should be thicker than the intended superstructure, and the projections thus formed, usually of quarter brick on each side, are called "set-offs." Before laying walls of houses, trenches are dug, and the foundation tried with a crowbar or rammer. If it is found to be loose, and the looseness due to superficial soil, this is removed, and its place supplied with fragments of stone and old broken bricks, which are closely rammed together. In some cases inverted arches of brick are built for foundation, or a stratum of concrete laid down. See CONCRETE.

Mortar composed of lime and sand is the common cement for brickwork. It should be equally and carefully applied; and the bricks wetted, in order that the mortar may adhere more firmly, by being absorbed into their pores. The force with which good mortar is capable of adhering to bricks is very remarkable. It is found to be the greatest in old structures that have been exposed to the continuous action of water. Such B. is said to be "water-bound" by workmen, and can scarcely be separated without breaking the bricks.

A fundamental principle to be rigidly observed in laying all kinds of brick is, that *no two contiguous perpendicular joints shall fall immediately below each other*, or, to use the bricklayer's phrase, the work must "break bond." The mode of arrangement of the bricks to effect this is called the *bond;* a layer or stratum of bricks is called *a course.* Bricks laid with their lengths in the direction of the course, and their sides to the wall-face, are called *stretchers;* those laid across the line of the course, with their ends forming the wall-face, *headers;* a layer of headers; a *heading course*, of stretchers, a *stretching course.*

The two kinds of bond almost exclusively used in England are the English and Flemish bond. English bond consists of alternate stretching and heading courses; Flemish bond, of a stretcher and header laid alternately in each course English bond is the strongest; Flemish bond, the more ornamental; and they are used accordingly. There are two other kinds of bond occasionally used—*herring* bond, and *garden-wall* bond. The former is applied to form the core of thick walls, where Flemish bond is used for the facing. A course of bricks is laid obliquely at an angle of 45° to the face of the wall; then above it, another course at the same angle, but inclined in the opposite direction, so that the joints may cross the first. This is considered to add to the strength of Flemish bond, but is objectionable on account of the triangular interstices necessarily left between the oblique bricks and the bricks of the facing. Garden-wall bond is only used for 9-inch walls, and formed by laying three stretchers and one header, and so on in each course. In order to strengthen Flemish bond, bands of hoop-iron are sometimes laid flatwise between the courses. This "hoop-iron bond" has superseded the old practice of using bond-timbers, which were inserted the whole length of the wall. The hoop-iron should be slightly rusted, to secure the complete adhesion of the mortar.

In constructing arches of brick-work, much care and skill are required. A wooden

centering is always used; and when very rude work only is required, common bricks are laid upon the centering, and the gaping interstices at the upper ends filled with rough brick wedges. For better work, each brick has to be properly beveled, according to the curve. When semicircular arches are made, all the bricks require an equal bevel, and therefore bricks molded uniformly to the required angle may be used; but for other curves and for flat arches, each brick has to be separately shaped by the bricklayer. In order to do this, a drawing of the required arch is made of the full size on a board; the bricks are laid upon this side by side, and shaped to the lines of the drawing; they are then transferred to their corresponding place in the structure. The bricks are first rudely shaped by the *brick-axe*, then finished on the *rubbing-stone*, a piece of rough-grained stone about 20 in. in diameter. In all kinds of B., the walls should be built up level throughout, in order that the *settlement* may be equal. An unequal settlement may produce a rupture of the wall.

B. is measured by the rod or by thousand. A rod contains 272 sq.ft. of standard thickness—that is, 1½ brick. This is equal to 306 cubic ft., and will, on an average, require 4500 bricks, allowing for waste. The weight of a rod of B. containing 4500 bricks, 27 bushels of lime, and 3 single loads of sand, is about 13 tons. The bricklayer is always attended by a laborer or hodman, who carries his bricks and mortar in a "hod"—a triangular wooden box, open at the top and one end, and supported on a round leg, by which the hodman holds it on his shoulder. A bricklayer's wages are considerable higher than those of the hodman. The laborers are generally Irishmen.

The surface of brick-work is sometimes ornamented by *pointing*. This is done by raking out the mortar of the joints to a small depth, and filling up again with blue mortar, and marking the courses with the edge of the trowel. This is called *flat-joint* pointing. When the courses are marked by a neatly pared raised line of white plaster of about half an inch in thickness, laid upon the blue mortar, it is called *tuck* or *tuck-joint* pointing. Colored bricks, as a means of external ornament, have been extensively and most effectively used in n. Italy and Germany. The works of Mr. Ruskin, Mr. Gally Knight, Webb's *Continental Ecclesiology*, Street's *Brick and Marble of the Middle Ages*, and Fergusson's *Hand-book of Architecture*, may be consulted for illustrated examples of these.

Chromatic brick-work is now becoming very extensively used in England, especially by architects who are endeavoring to revive the style of architecture called by themselves English Gothic, and by some others Venetian Gothic, in which the pointed arch, formed of colored bricks, forms one of the prominent features. These architects maintain that, as they are compelled to construct with B., it is more honest to use bricks ornamentally, than by means of stucco to obtain an external imitation of stone; and as B. admits of but little ornamentation in relief, they use variation of color, of which B. is peculiarly susceptible, and thus produce a sort of architectural mosaic. The eloquent and popular advocacy of these views by Mr. Ruskin, and the skill and enthusiasm with which many young and rising architects are carrying them out, seem likely to bring about a great development, almost amounting to a revolution in English domestic and ecclesiastical architecture.

BRICOLLE. See Ballista.

BRIDAINE, Jacques, a French home-missionary preacher, 1701–67. Though a strict Roman Catholic in principle, he frequently advocated the cause of the Protestants with great boldness, and displayed personal kindness to many who were suffering persecution. He made more than 250 journeys in all parts of France, and became universally popular. His sermons and spiritual songs, or hymns, have been printed.

BRIDE—BRIDAL. The word bride (the radical signification of which is thought by some to be "appropriated," "owned") is common to all the Gothic languages, and also to Welsh (Ger. *braut*, Welsh *priod*), and signifies betrothed or newly married. Alone, the word denotes the newly married woman; with the addition of the syllable *groom* (a corruption of *guma* = Lat. *homo*, a man), it denotes the newly married man (Ang. Sax. *brydguma*, Ger. *brautigam*). In Welsh, *priod-fab* (betrothed youth) is bridegroom, and *priod-ferch* (betrothed maid) is bride. Bride is the root of a variety of terms connected with marriage, as bride-favors, bride-cake, etc. Bridal is for *bride-ale* (Ang. Sax. *bryd-eale*), the marriage-feast. Bridemaids, or attendants on brides, appear to have been in use among the Anglo-Saxons, and are mentioned in early accounts of marriage ceremonies. A part of their duty consisted in dressing and undressing the bride. Bridemaids, as mere ceremonious attendants at marriages, are still in use in England. The husband had an analogous body of attendants, called bridegroom-men; but they have disappeared in modern usage, and their only representative is one confidential friend in attendance. In Scotland, this personage is called the best man. One of his duties is to pull off the bridegroom's right-hand glove, while one of the bridemaids does the same service for the bride, when the pair are requested to join hands.

Bride-favors are small knots of white ribbons, which are pinned to the breasts of all who are in attendance at weddings, nor are even the postboys and their horses' heads left undecorated with these gay trappings. The origin of the bride-favor is said to be the true-lovers'-knot—something symbolical of the union of hearts and hands on the

occasion. In various old plays and poems there are allusions to bride-favors or ribbons, as that in Herrick's *Hesperides:*

What posies for our wedding-rings,
What gloves we'll give and ribbonings.

The BRIDE-CAKE is also symbolical in its origin. "The ceremony used at the solemnization of marriage among the Romans was called *confarreation,* in token of a most firm conjunction between the man and wife, with a cake of wheat or barley. This, Blount tells us, is still retained in part with us, by that which is called the bride-cake used at weddings."—Brand's *Popular Antiquities.* The old English and also Scottish custom of breaking a cake over the head of the bride on entering her new dwelling, perhaps points to a usage of the most remote antiquity—the sprinkling with wheat as a token of plenty. In modern times, the bride-cake is a stately piece of confectionary, consisting of a rich cake as a basis, on which is reared a castellated structure, with various fanciful devices, the whole being covered with a preparation of white sugar. This fabric is cut up and given in pieces to the guests, as part of the wedding jovialty.

BRIDE'WELL, a well between Fleet street and the Thames, dedicated to St. Bride, which has given its name to a palace, parish, and house of correction. A palace, described as "a stately and beautiful house," was built here, in 1522, by Henry VIII., for the reception and accommodation of the emperor Charles V. and his retinue; and king Henry himself also often lodged here, as, for instance, in 1525, when a parliament was held in Blackfriars; and in 1529, the same regal personage and his queen, Catharine, lived in the B. while the question of their marriage was argued. In 1553, Edward VI. gave it over to the city of London, to be used as a workhouse for the poor, and a house of correction "for the strumpet and idle person, for the rioter that consumeth all, and for the vagabond that will abide in no place." Queen Mary having confirmed the gift, it was formally taken possession of in 1555 by the lord mayor and corporation. The B. was afterwards used for other persons than the class above named, and at last became a place of punishment, as it now is. As a house of correction, it is not under the sheriff's charge, but is governed by a keeper wholly independent of that officer.

By the 15 and 16 Vict. c. 70 a new house of correction is established for the city of London. See CORRECTION, HOUSE OF.

BRIDGE (Ang.-Sax. *brycg;* Dutch, *brug;* Ger. *brücke*) is a structure for carrying a road over a stream, river, ravine, low ground, or other impediment to its course. A bridge for carrying a canal or other water-course, is called an aqueduct (q.v.); one for carrying a railway is sometimes called by the recently coined, though not very correct, word *viaduct* (q.v.). Bridges are formed of stone, brick, cast-iron, or timber arches; of timber beams or frame-work, supported on piles or on masonry; of iron rods or chains, in which case they are called suspension-bridges; of lattice-work; or of cast or wrought-iron girders. Sometimes a combination of beams and suspension-rods is used. Of late years, the plan of tubular or hollow wrought-iron girders has been frequently and successfully employed, the first great example being the Britannia bridge (q.v.).

Bridges are either fixed or movable. Of movable bridges there are various kinds. *Flying-bridges* and *floating-bridges* are, in fact, mere ferry-boats (see FERRY) with gang-ways attached, and other provisions for safe and ready transport, and which are drawn across the stream by ropes. *Draw-bridges* and *swing-bridges* are constructed in two parts, that turn on pivots—in the former, the parts are lifted vertically; in the other, they are moved round horizontally. A *sliding-bridge* runs backward and forward on wheels or rollers. Another kind is much in use in low districts like Norfolk, where the water flaws lazily, and almost on the land-level. These are sometimes called pontoon-bridges, from the movable roadway being balanced at a small height above the water-level on a pivot working in a large pontoon or hollow cylinder sunk in the bed of the river—the ends of the roadway of the B., when laid across the river, resting freely on piers on either side. There are several such bridges in use over the Ouse. The pivot is set in the center of the stream, and, when necessary, the B. is turned round on it by machinery, till it lies parallel to the banks, and permits the passage of barges on either side. In a flat district, these bridges are exceedingly appropriate. See also BRIDGE, MILITARY.

Convenience must have led men in a very rude state of society to form bridges, in order to the easier communication between districts separated by rivers. On most streams there occur fords, but often these are not to be found where they would be most desirable. The most rudimentary form of a B. may be assumed to be a series of stepping-stones, such as are yet almost everywhere to be found on river-courses at some point. Large stones deposited in the streams at the shallows or fords, would first give a chance to a passenger of getting across dry shod; by and by, where one or two stones were wanting to complete the steps in the passage, they would be supplied. Next, it would naturally occur to give greater security to the passage, by laying planks or trees across the stepping-stones, so as to avoid the risks attending stepping or leaping from the one to the other. In the arrangement of planks resting thus on stones, we have the first advance in the art of bridge building, the suggestion at once both of piers and roadways; and beyond this stage, the art would appear not to have advanced for a very long period. From the Greeks, we have accounts of bridges built by Semiramis,

Darius, Xerxes, and Pyrrhus; and in Egypt, necessity early compelled the formation of bridges in connection with the canals constructed for the purpose of irrigation. But all these would appear to have been rudimentary in form, and to have consisted simply of piers, with the intervals between them spanned by beams of timber or large flat stones. Sometimes boats moored in the stream served the purpose of piers, as was the case with the famous B. of Xerxes across the Hellespont. Bridges of boats are in use to this day. The principle of the arch was long known before it was applied to the art of bridge-building. See ARCH. That application we owe to the Romans, whose first great work in which the arch was employed, the Cloaca Maxima (q.v.), is referable to the time of the Tarquins. The Ponto de Rotto, or Senators' B. (127 B.C.), erected by Caius Flavius, appears to have been the first instance of its application to bridges. In the course of the great engineering undertaking of the Roman empire under Augustus Cæsar for the formation of roads and supply of water to Rome, its application became general; and afterwards, the empire having extended its bounds, the necessity for ready communication between its provinces, led to the erection of numerous splendid bridges therein, many of which, indeed, surpassed in their greatness those of Rome itself. But although the Romans have unquestionably the merit of having originated the art of bridge-building proper in Europe, yet it seems doubtful whether the principle of the arch was not applied by eastern nations to bridge-building long before the dawn of the greatness of the Roman empire. The Chinese are said to have been before the west in this as in other arts, though the antiquity of some of the bridges on which this assertion is rested may well be doubted, considering the uncertainty which pervades the chronology of that extraordinary people.

It is impossible here to trace in detail the progress of the art. For a long time after the decay of the Roman empire, it made no progress. It revived in the 11th c., but again languished to the beginning of the 18th, when the formation of the corps of the Ponts et Chaussées in France favored its further growth. Henceforth, many splendid bridges were erected both in Britain and the continent. In 1775, Mr. Pritchard of Shrewsbury, introducing the use of cast iron in the erection of bridges, originated a valuable style of construction. The genius and works of Telford bring us to the present time. Within half a century, the use of steam, the development of the canal system, and the necessity especially for railway-bridges, with the immense amount of capital at the disposal of engineers for purposes of bridge-building, have caused a rapid evolution of all the principles and possible modes of the art. Among the new forms called forth within the century by the increasing demand for facilities of communication, are the suspension B., the wrought-iron girder and tubular bridges, and the lattice-bridges. Several of the new bridges over the Thames are models of engineering skill and taste. The Menai and Britannia bridges were regarded when erected as perfect marvels of the art, and yet they have since been surpassed. In America, the B. of Trenton, over the Delaware, the great Portage viaduct, and the Niagara suspension B., are equal to any similar works in the world. The Tay B., opened in May, 1878, is the longest (2 m. in length) and perhaps the greatest achievement of modern engineering skill. The variety of complex structures of wood and of iron that now span streams and hollows is endless. For some of the more important forms, see FRAME, LATTICE, TUBULAR, and SUSPENSION BRIDGES. What follows here, relates chiefly to arched or masonic bridges, and is confined to the more general and obvious conditions which such bridges must fulfill, avoiding the mechanical theory of their stability as too abstruse for popular exposition.

An arched B. rests between masses of masonry on opposite sides of a river, called its *abutments* (q.v.). The intermediate points of support of the arches are the piers (q.v.), which are rarely built so strong as to be able of themselves to resist the lateral thrust of the arches resting on them, if the thrust of one arch did not counteract that of another. The arch itself is the curved construction between adjacent piers. The chief terms used in speaking of the arch itself are explained under ARCH. In addition, may be noticed the *spandril,* the name given to the filling in above the extrados to the roadway. The *chord* or *span* is the distance between the piers; while the *rise* of the arch is the perpendicular distance between the level of the springing and the horizontal through the key.

When a B. has to be erected, the question of what form it should be, falls to be settled by a variety of considerations. Regard to appearance affects the question, but the material points are its sufficiency for the purposes for which it is intended, and its security and durability The nature of the embankments and of the soil in the water-bed, together with the nature of the water-shed, or country drained by the stream, may make it necessary that the B. should not be an arched bridge at all, but a suspension or tubular bridge. But if it is to be an arched B., then the most important questions respect the number of its piers and the form of its arches. If vessels must be free to pass under it, the arches must be lofty, and the abutments high; so also must they be if the river is exposed to sudden elevations of its level by floods. Formerly, a prejudice existed against laying a B. across a stream at any other angle than at right angles to its course. The reason was, that, the theory of the skewed arch (q.v.) being unknown, the obliquity of the B. to the water-course involved a corresponding obliquity of its piers to the water, which greatly increased the risk of the B. suffering from floods. But the skewed arch allows a B. to be thrown at any angle across a river, with its piers all parallel to the

stream; and many an awkward turn in our public roads would have been spared us, had the skewed arch only been earlier known.

After making allowance for the requirements of position and traffic, the form next must be considered, more particularly in relation to the stream. The stream principally affects the form, through prescribing the number of piers. Each pier takes up so much of the water-course, and thus narrows the effective passage of the water. The immediate consequence of narrowing the channel is to increase the velocity of the stream. As the velocity of the stream increases, it tends more and more to carry off the soil in the neighborhood of the piers, and finally, by deepening its course, to undermine them. From this consideration, the effect of too many piers will be obvious; but indeed this is not matter of speculation, for many bridges—among others, a B. of Smeaton's at Hexham—have been destroyed from this cause, thus falling from the very overabundance of support! To know how many piers may with safety be used, the volume of water that flows through the channel, both ordinarily and in winter-floods, must be ascertained, which can be done very nearly by calculating the mean of many soundings taken at different states of the river, and at a succession of points across its bed. There is another way in which the stream affects the form. If it is liable to floods, care must be taken to make the piers so high as to elevate the spring of the arches above the highest level attainable by the water. In connection with this part of the subject, it must be remembered, too, that floods are apt to carry down trees and other floating masses, which, if the arches do not afford them passage, become powerful levers for the destruction of the bridge.

The form of the B. being determined on, the remaining questions relate to its stability. This depends on the strength of the abutments and piers, and the balanced equilibrium of the arches. The importance of securing proper foundations for the abutments and piers cannot be over-estimated, and very frequently their foundations, owing to the nature of the soil, have to be artificially constructed. See Piles, Coffer-dam, and Concrete. In considering the stability of the B., the first thing is to ascertain the forces which will act to destroy it. This is ascertained by calculating the extreme passing load, and also the weight of the structure above the arches, and of the arches themselves. A scientific and skilled engineer is then able to judge what amount of strain or destructive pressure will be exercised by these weights on the several parts of the structure, and thus to adapt the strength at every point to the strain. As to the passing load, it is usual to calculate on 240 lbs. per foot, superficial, of the whole area in ordinary bridges, and on 960 lbs. in railway bridges. The weight of the superstructure and arches is a question for practical measurement. As to the remaining pressure—viz., that of the stream—it must be ascertained for the highest floods. It is calculated from knowing the mean velocity of the stream, and the amount of surface exposed to it. The surface is readily observed by means of floats; and when this is under 10 ft. per second, the mean velocity is found to be about one fifth less. The stress of the stream on the bridge is diminished by the expedient known as a cut-water, which is an angular projection from the pier. The best form for a cut-water has practically been ascertained to be an equilateral prism, presenting an angle of 60° to the water-course. In all bridges, these are to be found on the sides of the piers presented to the stream; and in tidal rivers, they are built on the lower side as well.

After the conditions already mentioned are satisfied, taste has more to do with the form of the arches than anything else. The forms in use are the old semicircular, the elliptical—usually got at by putting together several circular arches of different radii—and the segmental arch. The semicircular arch was almost exclusively used in the more ancient bridges. This arch is the most solid and most easily constructed, as all the voussoirs may be worked from the same mold. It requires, however, high banking, as its height is equal half its breadth; and where the water-level greatly changes, it is particularly unsuitable, from the great height necessary to be given to the piers, to carry the intrados out of water-reach. The elliptical arch and the segmental of 60° are, besides, far more pleasing in appearance.

In possible extent of span, the masonic bridge is far exceeded by suspension and girder bridges. At Chester there is a stone arch with a span of 200 ft.; in the Britannia tubular bridge the span is 460 ft.; in the suspension bridge over the Menai strait, 600 ft.; and in the suspension bridge at Freiburg, Switzerland, 870 feet. The railway bridge across the Tay, near Dundee, of iron girders is remarkable for its great length, 3450 yards. See Tubular Bridge and Suspension Bridges: Cantilever Bridge.

The principal objection to the wooden B. is its liability to decay, besides which it is liable to warping, through the swelling and contracting of its beams. The latter objection applies also to iron bridges, but in their case, the contractions and expansions may be compensated for, as in the compensation balance of a watch, or the compensation pendulum.

Public bridges are maintainable at the expense of the counties in which they are situated; but in many cities and boroughs, the inhabitants have acquired by prescription a liability for this expense, and by the 13 and 14 Vict. c. 64, the management and control of such bridges is given to the council of the city or borough. If part of a public bridge be within one county or other place on which the liabilty rests, and the other part of the bridge be within another, each party or body shall repair that part of the bridge which

is within its own boundaries. Besides the bridge itself, the county liable is bound by the 22 Henry VIII. c. 5, to repair 300 ft. of the road either way from the bridge. And such is still the state of the law as to all bridges built prior to the passing of the highway act, 5 and 6 Will. IV. c. 50. But by that act it is provided that, in the case of all bridges thereafter to be built, the repair of the road itself passing over or adjoining to a bridge, shall be done by the parish, or other parties bound to the general repair of the highway of which it forms a portion—the county being still subject, however, to its former obligation as regards "the walls, banks, or fences of the raised causeways, and raised approaches to any bridge, or the land arches thereof." See Stephen's *Com.*, vol. iii. p. 234. The neglect to make such repairs is treated in law books as a kind of negative offense; but there are positive offenses against bridges, which in the statutes are called nuisances, as to which, see the 43 Geo. III. c. 59. An act to amend the law in regard to the maintenance and management of roads and bridges in Scotland was passed in 1878, entitled "Roads and Bridges act." Private bridges are those erected and maintained under contracts authorized by private acts of parliament. See ROAD.

BRIDGE (*ante*). The most important American bridge as regards construction is that over the East river between the cities of New York and Brooklyn, commonly known as the "Brooklyn bridge." The land approaches are of stone and brick in arches and piers, terminating at the river in the grand stone piers that rise 278 ft. above high-water. The following official account of dimensions and progress is down to the close of 1879: construction commenced Jan. 2, 1870; size of New York caisson, 172×102 ft.; size of Brooklyn caisson, 168×102 ft.; timber and iron in caisson, 5253 cubic yards; concrete in well-holes, chambers, etc., 5669 cubic ft.; weight of New York caisson, about 7000 tons; weight of concrete filling, about 8000 tons; New York tower contains 46,945 cubic yards of masonry; Brooklyn tower contains 38,214 cubic yards of masonry; length of river span 1595 ft. 6 in.; length of each land span, 930 ft.—1860 ft.; length of Brooklyn approach, 971 ft.; length of New York approach, 1562 ft. 6 in.; total length of bridge, 5989 ft., or 1.134 m.; width of bridge, 85 ft.; number of cables, 4; diameter of each cable, 15¾ in.; first wire was run out May 20, 1877; cable-making really commenced June 11, 1877; length of each single wire in cables, 3578 ft. 6 in.; ultimate strength of each cable, 12,200 tons; weight of wire, 12 ft. per lb.; each cable contains 5296 parallel (not twisted) galvanized steel, oil-coated wires, closely wrapped to a solid cylinder 15¾ in. in diameter; depth of Brooklyn tower foundation below high-water, 45 ft.; depth of New York tower foundation below high-water, 78 ft.; size of towers at high-water line, 140×59 ft.; size of towers at roof course, 136×53 ft.; total height of towers above high-water, 277 ft.; clear height of bridge in center of river span above high-water, at 90° Fah., 135 ft.; height of floor at towers above high-water, 119 ft. 3 in.; grade of roadway, 3¼ ft. in 100 ft.; height of towers above roadway, 159 ft.; size of anchorages at base, 129×119 ft.; size of anchorages at top, 117×104 ft.; height of anchorages, 88 ft. front and 85 ft. rear; weight of each anchor plate, 23 tons; total cost of bridge, exclusive of land, $14,627,379; total weight of suspended structure, 17,780 tons. Engineer, W. A. Roebling. The bridge was opened, '83. 45,000 persons can cross hourly, supposing each to move at the rate of 200 ft. per minute, and 1440 vehicles.

Some other American bridges may be briefly described. One of the earliest of note is that over the Schuylkill at Philadelphia, which Fanny Kemble poetically described as "a scarf rounded by the wind and thrown over the river." It was accidentally burned in 1838. The railroad bridge at Bellows Falls, built in 1850, has a span of 250 feet. The Susquehanna bridge (of the Wilmington and Baltimore railroad) is 3500 ft. long, with 13 piers and 2 guard piers at the draw. The spans are 250 ft. long, and the draw-span 176 feet. The Niagara Suspension bridge has a span from center to center of towers of 821 ft., and is 245 ft. above the river. The bridge (suspension) over the Ohio between Cincinnati and Covington has a span of 1067 ft., and is 91 ft. above low-water. The Clifton bridge (over Niagara river just below the falls and above the suspension bridge) is 1190 ft. from bank to bank, and 1268 ft. between the points of suspension on the towers, and is 193 ft. above the water. The Victoria tubular bridge over the St. Lawrence at Montreal has a length of tube of 6600 ft., carried over 25 openings of 240 ft. each, and one of 330 ft.; with the approaches this bridge is 9084 ft. long. The Quincy bridge over the Mississippi (draw) has 17 spans, two of 250 ft., three of 200, 11 of 137, and a draw-span of 360 feet. The bridge over the Missouri at Omaha is 2800 ft. long in 11 spans. The bridge of the New York Central railroad over the Hudson at Albany is 1740 ft. long, in 15 spans and a draw. But the most noteworthy of railroad bridges is that over the Mississippi at St. Louis. It is in three immense spans, those at the end being 497 ft. each, and the middle one 515 feet. Over the railroad floor is a carriage and foot roadway 34 ft. wide between the foot-walks, which are each 8 ft. wide.

The terrible disaster of the fall of the Tay bridge in Scotland, the center portion of which went down in a furious gale on the night of the 27th Dec., 1879, justifies a brief description of that structure. It was the largest iron bridge in the world, crossing the river, or arm of the sea, a mile and a quarter w. of Dundee, with a length from shore to shore of 10,320 ft. (only 240 ft. less than two miles). Commencing at the s. or Fife shore there were three spans of 60 ft., two of 80 ft., 22 of 120 ft., 14 of 200 ft., 16 of 120 ft., 25 of 66 ft., one of 160 ft., and six of 27 ft.—in all 89 spans, the rails being 88 ft.

above the water. The portion which fell consisted of 12 spans somewhere near the middle of the bridge. A train of six passenger cars and the brakemen's van either went down with the bridge or ran into the vacancy in the dark, and not one person survived. There were over 90 lives lost.

The following statement comprises a list of the most important railway bridges and viaducts constructed by European and American railway companies. There are stone, wood, and iron structures, all of which appear under a separate head:

Stone Bridges and Viaducts.—Ballochmoyle viaduct, Glasgow, and S. W., width of span, 181 ft.; viaduct at Nogent, S. M., near Paris, 164 ft.; Durham Junction viaduct, 160 ft.; bridge near Wolmsdorf, Silesia, 150 ft.; bridge near Maidenhead, built by Brunel, 1835, 129 feet. There are three or four structures to be added to the foregoing, whose widths of openings exceed 100 feet. This includes the bridge at the Point-du-Jour, at Paris; the viaduct near Loebau, in Saxony, and the bridge at Point-de-Pille, on the line between Orleans and Bordeaux. The highest arches are principally found in Germany, and in the second line in various parts of France.

Viaducts of Stone and Brick.—Height of arch; over the Goeltz valley, in Saxony, 256 ft.; over the Elster valley, in Saxony, 223 ft.; over the Riofredo, in Austria, 197 ft.; at Diedenmuhle, near Chemnitz, Saxony, 170 ft.; at Chaumont, Paris to Mulhouse, 164 ft.; at Kalte Rinne, Semmering, Austria, 151 ft.; at Fure, near Grenoble, 135 ft.; at Comelle, near Creil, Paris, 131 ft.; at Wagnergraben, Semmering, Austria, 128 ft.; at Combe-Bouchard, Paris-Lyons railway, 128 feet. In addition to these there are several other bridges and viaducts whose height varies from 100 to 125 feet. Among the principal are: the viaduct over the Tranz valley, in Austria; bridge across the river Fulda, near Kragenhof, Hanover; the Goel viaduct at Aix-la-Chapelle; viaduct at Mireville, on the line between Havre and Rouen; four more are in Saxon Switzerland; the rest in various parts of France. The longest viaducts and bridges are to be found in England; notably the viaduct on the line from London to Greenwich; the system of the South-western, South-eastern, Chatham and Dover, Great Eastern, and of other lines serving the metropolis. The next importance attaches to the bridge spanning the Lagoons and running into Venice, the bridge and viaduct over the river Elbe, at Dresden, and a few others.

Timber-built Bridges and Viaducts.—The most prominent structures are the following: Over the river Mista, on the Moscow and St. Petersberg railway, nine openings, each 200 ft. wide; over the river Elbe, at Wittenberg, with 14 openings, varying in width from 140 to 100 ft.; bridge near Woltenhofen, on the road from Lindau to Augsburg, Bavaria, one opening, 170 ft. wide; bridge near Kempten, on the same line as the foregoing, with five openings, varying in width from 85 to 140 ft. each. There are two wooden bridges on the North Shields, Newcastle line, one with seven, the other with five openings, the widest of which spans about 135 feet. The United States possess wooden bridges in very large numbers, and of much greater dimensions than are found on European roads. Among those noteworthy is the bridge over the Delaware river, on the Erie road, with two openings, each of a width of about 260 feet. The next structure of importance is a bridge over the Susquehanna river, near Columbia, with 29 openings, each about 200 ft. wide. There are two bridges crossing the Connecticut river, with spans of 174 feet. These are the most prominent bridges; but there are numerous other very remarkable structures, which, though of smaller dimensions, give evidence of great engineering skill.

Iron Bridges and Viaducts.—The following list comprises structures of this class of the greatest extent in length:

	Feet.
Parkersburg bridge, West Virginia, U. S.	7,045
St. Charles bridge, Missouri, U. S.	6,536
Over the river Ohio, near Louisville, Ky., U. S.	5,310
Over the river Delaware, Pennsylvania, U. S.	4,920
Over the East river, New York	5,000
Victoria bridge, St. Lawrence river, Canada	4,980
Over the river Rhine, at Mayence, Germany	3,380
Over the river Tongabudda, Bombay, Madras	3,730
Over the river Mississippi, near Quincy, U. S.	3,200
Over the river Missouri, near Omaha, U. S.	2,790
Over the river Vistula, near Dirschau, Germany	2,750
Over the river Danube, near Stadlau, Austria	2,520
Over the river Po, near Mezzano-Corti, Italy	2,485
Over the river Tamar, near Saltash	2,190
Over the river Lek, near Kuilenburg	2,185
Over the river Mississippi, near Dubuque, U. S.	1,758
Over the river Sorai, in British India	1,745

The foregoing comprises a list of the longest bridges constructed of iron, but it does not include all the most important works from an engineering point of view. The bridges which have the widest or the most numerous openings are given in the subjoined list, and comprise all the great marvels which engineering skill and ingenuity have produced: Britannia bridge, Menai straits: four openings, each 460 ft., and two openings,

each 230 feet; built by Robert Stephenson and Fairbank, 1846–50. Conway bridge, Menai straits: one opening, 400 feet; built by Stephenson, 1847–48. Victoria bridge, crossing the St. Lawrence river at Montreal: one opening 330 ft., and 24 openings, each 240 feet; built by Stephenson. Bridge over the Garonne, near Langon, on the Bordeaux-Cette line: one opening of 245 ft., and two each of 210 feet. Over the Aire, near Brotherton: one opening of 225 feet. Over the Trent, near Gainsborough, on the Manchester, Sheffield and Lincoln line: two openings, each 150 ft. wide. Over the river Lek, a branch of the Rhine, near Kuilenburg, Holland: one opening of 150 ft., one of 80 ft., and seven of 57 feet: built 1868–70. Over the river Ohio, near Louisville, U. S.; one opening of 400 ft.; one of 370 ft.; six, each of 236 ft.; 14, varying in width from 210 ft. to 140 ft.; one of 100 ft., and two, each of 50 feet; built in 1868. Over the Vistula, near Dirschau, Berlin-Königsberg line—built 1850–57, by Lentze: six openings, 350 ft. each. Over the Waal, near Lommel, Belgium: three openings of 400 ft. each, and eight of 190 ft. each. Over the Rhine, near Griethausen: one opening of 330 ft., and 20 of 60 ft. each; built in 1863–64, by Monie. Over the Rhine, near Hamm: four openings, each of 330 feet; built in 1868–70, by Pichier. Over the Dieppe, near Moerdyk, Holland: 14 openings, each of 330 ft., and two of 51 feet. This structure resembles in a measure the unfortunate Tay bridge. It was completed in 1871. Over the Rhine, near Cologne: four openings of 320 ft. each; built, 1856–60, by Lohse and Wiedman. Over the Nogat, near Marienburg, Baltic: two openings of 312 ft. each. Over the Wye, near Chepstow: one opening of 300 ft., and three, each of 100 feet; built by Brunel, 1850–52. Over the Rhine, near Mannheim: three openings of 295 feet. Over the Böyne, near Drogheda: one opening of 270 ft., and two each of 140 feet; built by Barton, 1855. Over the Danube canal, near Vienna: one opening 260 ft. wide; built in 1860 by Koestlin. Over the Danube, near Stadlau, Austri a: five openings each of 250 ft., and 10 each of 110 feet; built by Ruppert, 1868–70. Over the Trent, near Newark: one opening of 240 feet; built by Fox and Henderson, 1851. Over the Thames, Blackfriars: one opening of 205 ft., two of 195 ft., and two of 170 feet; built 1863–64. Over the Kinzig, near Offenburg, Germany: one opening of 190 feet. Over the Eipel, Hungary: one opening of 185 ft., and three of 145 feet. Over the Rhine, near Strasburg: three openings of 185 feet. Over the Grau, in Hungary: one opening of 166 ft., and three of 144 ft. each, built by Ruppert, 1858. Over the Saar, near Freibourg: five openings, each of 160 ft., and two of 142 feet. Crumlin Viaduct, Newport-Abergavenny line: 10 openings each of 160 ft. width; built by Liddle and Gordon, 1853. Over the Lahn, near Coblentz: one opening, 150 ft. wide. Over the Thames, near Windsor: one opening of 200 feet; built by Brunel, 1849. Over the Weser, near Corvey, Germany: four openings, each of 185 feet; built by Schwedler, 1863–64. Over the Orne, near Caen, France: one opening of 145 feet. Built by Maier, 1858. On the Blackwall line: one opening, 120 feet. Over the Tamar, at Saltash: two openings of 450 ft., and 17 openings varying from 70 to 90 feet; built by Brunel. Over the Rhine, at Mayence; four openings, each of 335 ft., six of 115 ft., and 22 openings varying in width from 50 to 80 feet. Over the Isar, near Hesselohe, Germany: two openings, each of 170 ft., and two each of 85 feet. Over the Elbe, at Hamburg: seven openings, each of 335 ft., and three openings of 310 feet; built by Lohse, 1870. Over the Yssel, near Zutphen, Holland: one opening of 320 ft., and two of 55 feet. Over the Ohio, near Benwood, United States: one opening of 320 feet. Over the Mersey, near Runcorn, London and North-western railway: three openings of 300 ft. each. Over the Missouri, near Omaha, United States: 11 openings, each of 270 feet; built by Dodge, 1860–61. Over the Danube, near Manthausen, Austria: five openings of 260 ft., and two of 90 feet. Over the Danube, at Vienna, North-western line: four openings of 260 ft., and 14 openings of 95 feet; built by Hellwag and Gerlish, 1870–72.

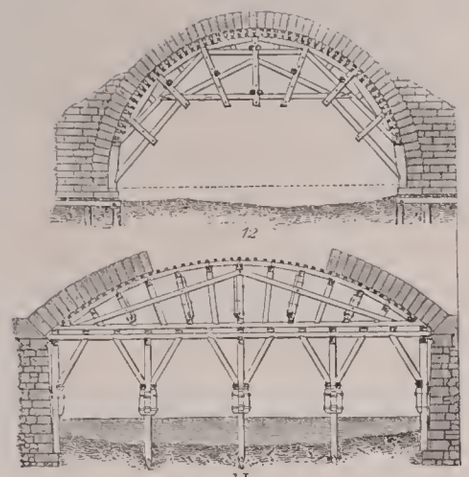
The railway suspension bridge over the Forth at Queensferry will be, when completed, the most remarkable application of the suspension principle in the world. The breadth of the Forth at Queensferry is rather more than a mile; but, as the viaduct is to be continued overland on the n. shore for several hundred yards, the whole length of the bridge will be about one mile and one third. This, however, gives no fair idea of the breadth of span to which the physical conditions require the suspension principle to be applied. In the midst of the firth, but rather nearer to the northern than to the southern shore, rises the rocky islet of Inchgarvie. On either side of this island the bed of the river sinks to a depth which is impracticable for engineering purposes. On the n. side the bed sinks to a depth of 210 ft., on the s. side to 180 ft., below the water-mark; and it is there, for a breadth of 1600 ft. on either side, that no practicable bottom can be found for piers, and therefore that the suspension principle has perforce to be resorted to. Between the deep furrow on the s. side of Inchgarvie and the southern shore there is a reach of comparatively shallow water, with a maximum depth of 30 ft., but within which foundations may be found for some 12 or 15 piers. Viewed in profile from the bosom of the firth, the bridge will thus present to view five distinct sections. First, there is a shallow-water section on the s. side, covering some 2000 ft., and supported on 16 piers; then there is the deep-water section, s. of Inchgarvie, traversed by a suspension bridge; next there is the island of Inchgarvie itself, over which the viaduct will be carried on two or three piers; then there is the deep-water section n. of Inchgarvie, spanned by a second suspension bridge; and, lastly, there is the northern shoreward section, which carries the

viaduct on 10 or 11 piers from the brink of the tide to the dead level of the Fife shore. The great features of the architectural design, as seen from the firth, will be the four pairs of lofty towers on which the massive steel chains which are to support the two suspension bridges will be hung, and the two pairs of landward buttresses to which the suspending chains will be anchored. Of the towers, two pairs will rise from the island of Inchgarvie, and will reach the imposing height of 596 ft. Two pairs on the shore of n. Queensferry, and other two on the brink of deep water on the southern channel, will attain to a height of 584 feet. The two pairs of buttresses on the n. and the s. side respectively will be, of course, less lofty; but they will be bold and striking masses of masonry. Those parts of the bridge, n. and s., which rest on piers, with a solid foundation, will consist of a single permanent way 25 ft. broad, and carrying a double set of rails. But the intervening portions carried by the suspension bridges will consist of two distinct and parallel branches, each 15 ft. broad, each carrying a single line of rails, and 100 ft. apart. These branches will be tightly braced together; and this arrangement has been adopted in order to give greater breadth, and therefore greater stability, to the whole structure. Seen from above, the outline of the design has the appearance of a shuttle with elongated points. The divergence of the branches begins at the massive piers, two on each side, to which the suspension chains will be anchored, and the maximum of divergence, 100 ft., will be attained before the lofty towers are reached. While the bridge throughout the greater part of its extent makes necessarily a straight course, the shoreward part at either end forms a gentle curve. From each shore to the beginning of the suspension bridge the line rises with a gradient of 1 in 100. In the shoreward sections, and in that over Inchgarvie, the permanent way rests on the upper members of the lattice-girders; but in the two suspension sections it rests on the lower members. By this contrivance here, as in the case of the Tay bridge, the full height of 150 ft. above the high-water mark is confined to the central sections only. It will be evident that each of the deep-water channels n. and s. of the island of Inchgarvie will be spanned by a double suspension bridge. Each of these double bridges will consist of four parallel and enormous lattice-girders—two for each branch. These girders will be 1600 ft. long. Seen in profile, their upper members will form an arched outline, with a maximum height of 50 ft. and a minimum of 19 ft. besides the towers. On these towers, of course, their ends will rest; but they will derive their main support from four immense steel chains, one for each girder, which will be slung over the towers and fastened to the anchoring piers at either end. The girders will be attached to the chains by stout wrought-iron rods at intervals of 50 feet. It is expected that this wonderful bridge will be completed by Jan. 1, 1885.

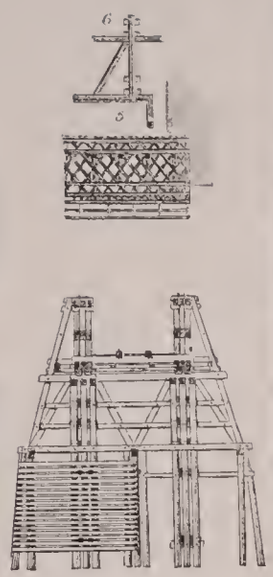
BRIDGE, Military, is a temporary construction, to facilitate the passage of rivers by troops, cannon, and military wagons. The most efficient are described under Pontoon; but there are many other kinds. A *bridge of boats* is formed by small-craft, especially cargo-boats, collected from various places up and down the river; trestles are placed in them to bring their tops to one common level; the boats are anchored across the river, and baulks of timber, resting on the trestles, form a continuous road from boat to boat across the whole breadth of the river; the boats ought to be of such size that, when fully laden, the gunwales or upper edges shall not be less than one foot above the water. *Rope-bridges* are sometimes but not frequently used by military engineers. A *boat-and-rope bridge* consists of cables resting on boats, and supporting a platform or road of stout timber. A *cask-bridge* consists of a series of timber-rafts resting on casks; the casks are grouped together in quadrangular masses; at certain intervals, timbers are laid upon them to form rafts, and several such rafts form a bridge; it is an inferior kind of pontoon-bridge. A *trestle-bridge* is sometimes made for crossing a small stream in a hilly country; it consists of trestles hastily made up in any rough materials that may be at hand, with planking or fascines to form a flooring, cables to keep the trestles in a straight line, and heavy stones to prevent them from floating. *Raft-bridges,* consisting of planks lashed together, are easily made of any rough materials that may be found on the spot; but they have little buoyancy, and are not very manageable. A *swing-flying bridge* consists of a bridge of boats, of which one end is moored in the center of the river, and the other end left loose; this loose end is brought to the proper side of the river, the boats are laden, and they make a semicircular sweep across the river by means of rudders and oars, until the loose end of the bridge reaches the other bank. A *trail-flying bridge* is a boat or raft, or a string of boats or rafts, which is drawn across a river by ropes, in a line marked out and limited by other ropes.

BRIDGE, Natural. See Natural Bridge.

BRIDGE-BUILDING BROTHERHOODS (Fr. *Frères pontifes;* Lat. *Fratres pontifices*) were religious societies that originated in the s. of France in the latter half of the 12th century. Their purpose was to establish hospices at the most frequented fords of large rivers, to keep up ferries, and to build bridges. The church during the middle ages regarded the making of streets and bridges as meritorious religious service. Whether or not the herdsman Benezet, subsequently canonized, was the founder or only a member of this fraternity, is as uncertain as the tradition which attributes to him the completion of the bridge over the Rhone at Avignon in 1180. The fraternity was sanctioned by pope Clemens III. in 1189; its internal organization was similar to that of the knightly

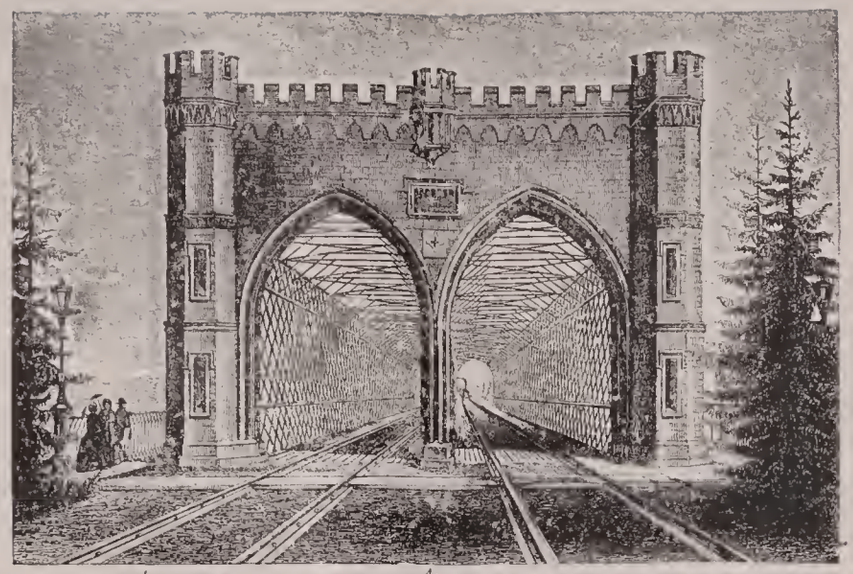

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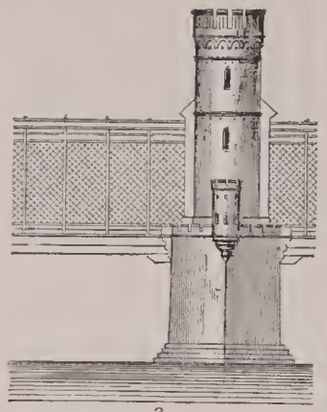
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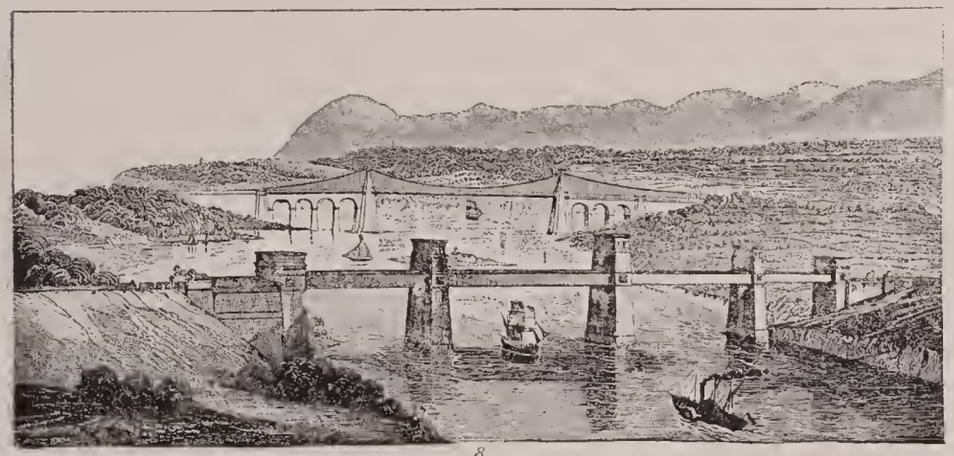
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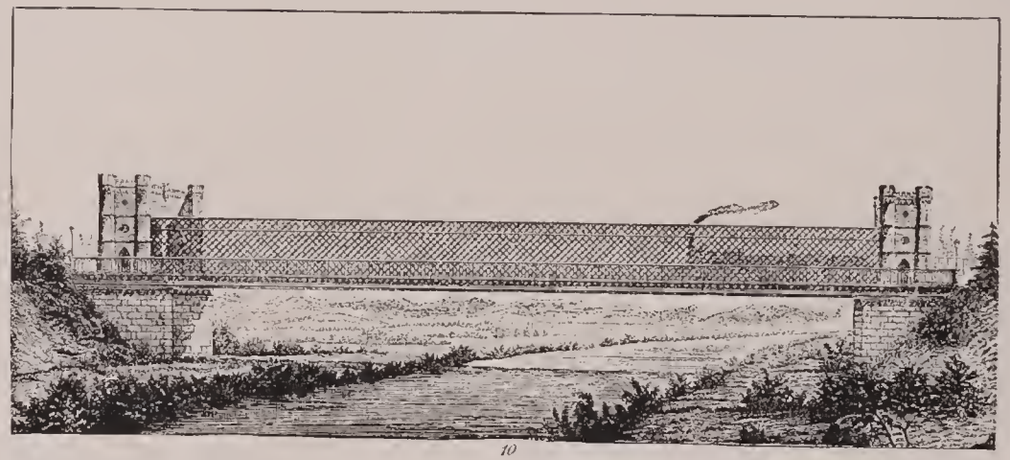

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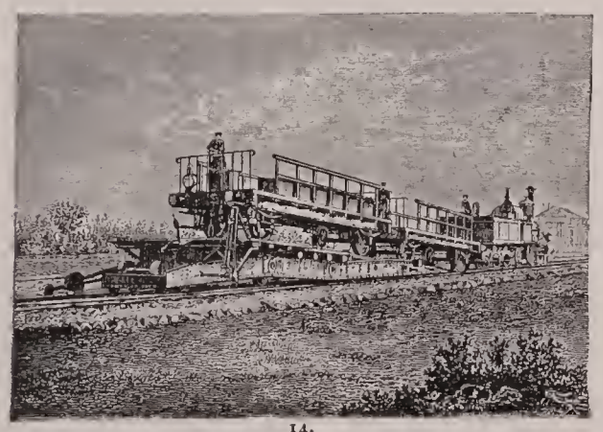

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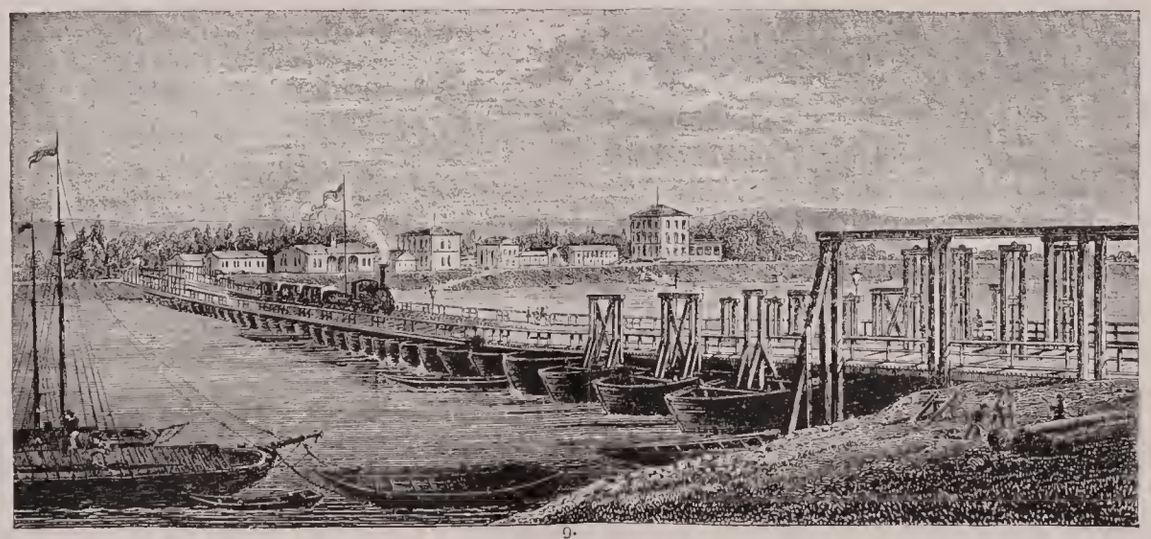

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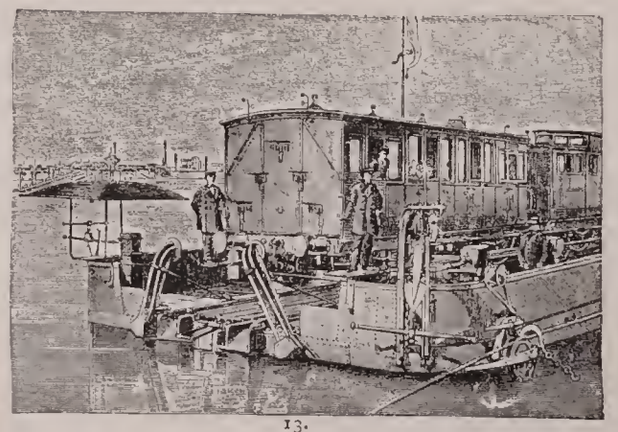

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BRIDGES, ETC.—1. Wooden bridges. 2. Double lattice-bridge. 3. Trestle-bridge. 4, 10. Bridge over the Kinzig (Baden). 5, 6, 7. Details of lattice-bridges. 8. Britannia and Conway bridges, Menai straits. 9. Pontoon-bridge over the Rhine. 11, 12. Method of constructing arches. 13. Floating-bridge. 14. Sliding-bridge.

orders, and the members wore as their badge or insignia a pick-hammer on the breast. In France, they labored very actively, but were gradually absorbed into the order of St. John. Similar associations sprang up in other lands, but under different names.

BRIDGE-HEAD, or TÊTE-DU-PONT, in military engineering, is a fortified post intended to defend the passage of a river over a bridge. It is a field-work, open at the gorge or in the rear, and having its two flanks on the banks of the river. The most favorable position is at a re-entering sinuosity of the river, where the guns can work better with the supporting batteries opposite. Bridge-heads are usually temporary works, hastily constructed. Their most frequent use is to aid a retiring army to cross the river in good order, and to check an enemy pressing upon it. Openings are left to allow the retiring army, with guns and carriages, to file through without confusion; and parapets are so disposed as to flank and defend these openings.

BRIDGEMAN, LAURA. This famous blind mute was b. in Hanover, N. H., United States, on the 21st Dec., 1829. She was a bright, intelligent child, but at two years of age was seized with a violent fever, which utterly destroyed both sight and hearing. For a time this so shattered her system, that there seemed no hope of recovery; but she rallied, and soon learned to find her way about the house and neighborhood, and even learned to sew and to knit a little. A strong passion for imitation began to develop itself, and by assiduously cultivating this power, she was at last enabled to emerge out of her life of unbroken darkness and silence, and take her place among the educated people of the day. In 1839, Dr. Howe of Boston undertook her care and education at the deaf and dumb school. The first attempt was to give her a knowledge of arbitrary signs, by which she could interchange thoughts with others. Then she learned to read embossed letters by the touch; next, embossed words were attached to different articles, and she learned to associate each word with its corresponding object. A pat on the head told her when she was right in her spelling-lesson. Thus far, however, the work was only an exercise of imitation and memory, roused into exertion by the motive of love of approbation, but seemingly without intellectual perception of the relation between words and things. It was like teaching a clever dog a variety of tricks. But at last the truth flashed upon her, that by this means she could communicate to others a sign of what was passing in her own mind. Her whole being seemed changed. The next step was to procure a set of metal types, with the letters cast at the ends, and a board with square holes for their insertion, so as to be read by the finger. In six months, she could write down the name of most common objects, and in two years had made great bodily and mental improvement. She grew happier, and enjoyed play like other children, amusing herself with imaginary dialogues, spelling old and new words, and with her left hand slapping the fingers of her right, if they spelled a word wrong; or giving herself a pat of approval, as the teacher did, when correct. Her touch grew in accuracy as its power increased; she learned to know people almost instantly by the touch alone. In a year or two more, she was able to receive lessons in geography, algebra, and history. She received and answered letters from all parts of the world, and was always employed, and therefore always happy. Her brain seems to have been unduly excited for a blind person; she not only held imaginary dialogues with herself, but dreamed incessantly by night; and during these dreams, while asleep, talked much on her fingers. She learned to write a fair, legible, square hand, and to read with great dexterity, and at last, even to think deeply, and to reason with good sense and discrimination. Keen, sensitive, and lively , in various occupation, her days now pass rapidly and pleasantly, mainly owing to the unremitting skill and kindness of Dr. Howe. She was saved by him from a life of hopeless, helpless darkness; educated and trained to take her part in the world; and now, as a teacher of the blind and deaf and dumb, is conferring on them the blessings she has herself received. She is probably among the most skillful of blind teachers.

BRIDGENORTH, a t. of Salop or Shropshire, on both sides of the Severn, 20 m. s.e. of Shrewsbury. It consists of an upper and lower town, connected by a bridge over the Severn. The larger part of the town is on the right bank, and is built on a sandstone rock rising 60 ft. above the river. Pop. '80, 7216. It returns one member to parliament. The navigation of the Severn formerly employed many of the inhabitants, but the traffic has been greatly injured by the introduction of railways. The town, which was at one time called *Bruges* or *Brug*, is said to be of Saxon origin. In the beginning of the 12th c., the earl of Shrewsbury defended the town unsuccessfully against Henry I. It was besieged in the same century by Henry II.; and during the civil wars it resisted the parliamentary forces for three weeks. A great portion of the town was on this occasion destroyed by fire. It has carpet and worsted manufactories. Bishop Percy was born here.

BRIDGE OF ALLAN. See ALLAN.

BRIDGE OF SIGHS, the covered passage which connects the doge's palace in Venice with the prison, over which prisoners of state were taken to confinement or to execution.

BRIDGEPORT, a seaport of Connecticut, U. S., at the mouth of the Pequannock, which empties itself into an inlet of Long Island sound. It is in lat. 41° 11′ n., and

long. 73° 12′ w., being 178 m. to the s.w. of Boston, and 58 to the n.e. of New York. Pop. '70, 19,835, having gained 6536 in 10 years. B. is connected by railways both with the interior and with the other places generally on the seaboard. Though the harbor does not admit large ships, having only 13 ft. on the bar at high-water, yet B. has a considerable coasting-trade, and a number of vessels engaged in the whale-fishery. Its manufactures are extensive, particularly of carriages, harness, fire-arms, and sewing-machines.

BRIDGEPORT (*ante*), a city in Fairfield co., Conn., on Long Island sound, and on the New York and New Haven railroad, at its junction with the Housatonic railroad, 56 m. n.e. of New York. The harbor at the entrance of Pequannock creek is large and safe, and is the center of a considerable coastwise trade. The most elegant portion of the city is Golden hill, an elevation of about 100 ft., commanding delightful views of sound and shore, and covered with fine residences, many of which are owned and occupied by New Yorkers. All of the city is modern and well built, the streets shaded by trees, and the residences are well provided with water and gas. The earliest settlement, then called Newfield, was in 1639; the city charter is dated 1836. In 1850, the population was 6080; in 1870, about 20,000. There are many superior schools, and some fine churches. The chief business, besides the water trade, is in manufacturing, and in this the making of sewing-machines takes the lead, there being three large establishments. Here is also the largest manufactory of metallic cartridges in the country; and there are carriage factories, iron foundries, harness, and other business. Pop. '80—29,148.

BRIDGER'S PASS, a defile in the Rocky mountains, in s. Wyoming, through which the overland stages went before the opening of the Pacific railroad. It is several miles long, and in most places has perpendicular side walls from 1000 to 2500 ft. high.

BRIDGET, SAINT (or, more properly, *Birgit* or *Brigitte*), a famous Roman Catholic saint, was b. in Sweden about the year 1302. Her father was a prince of the blood-royal of Sweden. When only sixteen, she married Ulf Gudmarson, prince of Nericia, a stripling of eighteen, by whom she had eight children, the youngest of whom, named Catherine, born in 1336, died in 1381, became *par excellence* the 'female saint of Sweden. Her husband and she now solemnly vowed to spend the remainder of their lives in a state of continence, and, to obtain strength to carry out their severe resolution, made a pilgrimage to the shrine of St. Jago de Compostella in Spain. On their return, Ulf died in 1344, and B. founded about the same time the monastery of Wadstena, in East Gothland. Sixty nuns and twenty-five monks were its first inmates. They received the rule of St. Augustine, to which St. B. herself added a few particulars. They constituted a new order, sometimes called the order of St. B., sometimes the order of St. Salvator, or the Holy Savior, which flourished in Sweden until the reformation, when it was suppressed, but it still possesses some establishments in Italy, Portugal, and elsewhere. Subsequently, St. B. went to Rome, where she founded a hospice for pilgrims and Swedish students, which was reorganized by Leo X. After having made a pilgrimage to Palestine, she died at Rome on her return, 23d July, 1373. Her bones were carried to Wadstena, and she herself was canonized in 1391 by pope Boniface IX. Her festival is on the 8th of October. The *Revelationes St. Brigittæ*, written by her confessors, was keenly attacked by the celebrated Gerson, but obtained the approval of the council of Basel, and has passed through many editions. Besides the *Revelationes*, there have been attributed to this saint a sermon on the Virgin, and five discourses on the passion of Jesus Christ, preceded by an introduction which was condemned by the congregation of the *Index*.

Not to be confounded with this Swedish saint is another St. Bridget, or St. Bride, as she is more commonly called, a native of Ireland, who flourished in the end of the 5th and beginning of the 6th c., and was renowned for her beauty. To escape the temptations to which this dangerous gift exposed her, as well as the offers of marriage with which she was annoyed, she prayed God to make her ugly. Her prayer was granted; and she retired from the world, founded the monastery of Kildare, and devoted herself to the education of young girls. Her day falls on the 1st of February. She was regarded as one of the three great saints of Ireland, the others being St. Patrick and St. Columba. She was held in great reverence in Scotland, and was regarded by the Douglases as their tutelary saint.

BRIDGETON, a port of entry in New Jersey, U. S., about 40 m. s. of Philadelphia. It occupies both banks of the Cohansey creek, about 20 m. above its entrance into Delaware bay, its two divisions being connected by a wooden draw-bridge, The town contains a public library, two newspaper-offices, an iron foundry, a rolling-mill, a nail-factory, a woolen-factory, and a glass-work. It likewise owns upwards of 15,000 tons of shipping. Pop. in 1870, 6820.

BRIDGETON (*ante*), the capital of Cumberland co., N. J., on the Cohansey river, 20 m. from Delaware bay, 36 m. s. of Philadelphia, at the terminus of the West Jersey and the junction of the New Jersey Southern railroads; pop. '80, 8729. It is a port of entry, the second in importance in the state. Its chief manufactures are glass, water and gas pipes, nails, castings, machinery, lumber, brick, ship-building, woolens, and canned fruits, in which nearly 200 firms are engaged. Among its educational advan-

tages are the South Jersey institute, the West Jersey academy, and several superior select schools. There are a good public library, more than a dozen churches, and several benevolent societies, one of which is for the care of destitute children. There are water and gas works, and three bridges over the river, the town being built on both banks. The climate is excellent, and the surrounding region is exceedingly fertile and well cultivated.

BRIDGETOWN, the capital of Barbadoes (q.v.), is situated on the w. coast of the island along the n. side of Carlisle bay, which forms its roadstead, in lat. 13° 4′ n., and long. 59° 37′ w. Pop. 21,384. It was founded about the middle of the 17th c., taking the name Indian Bridge, and later its present appellation, from a rude aboriginal structure which spanned a neighboring creek. The present city, however, is only 100 years old, the former having been almost destroyed by fire in May, 1766. In 1831, a part of B. was destroyed by a hurricane, and in 1845 it again suffered severely from fire. It is the residence of the bishop of Barbadoes and of the governor-general of the Windward islands. Except Broad street, the thoroughfares are irregular, and the shops or general stores, having no windows in front, look heavy and unattractive. There is a considerable trade.

BRIDGEWATER, a township in Plymouth co., Mass., 27 m. n.e. of Boston, on the Fall river and Bridgewater Branch railroads. It contains the state normal school, the state almshouse, and various manufactories. Pop. '80, 3,620.

BRIDGEWATER, a t. and port of Somersetshire, on both sides of the Parret (which is here spanned by an iron bridge), 6 m. in a direct line, and 12 by the river, from the Bristol channel, and 30 m. s.w. of Bristol. It stands on the border of a marshy plain, which lies between the Mendip and Quantock hills, but the country around is well wooded. It is chiefly built of brick. St. Mary's church has a remarkably slender and lofty spire. The Parret admits vessels of 200 tons up to the town; it rises 36 ft. at spring-tides, and is subject to a bore or perpendicular advancing wave, 6 or 8 ft. high, often causing much annoyance to shipping. Pop. in '81, 12,024. B. formerly returned two members to parliament, but was disfranchised in 1870. Bath or scouring bricks, peculiar to B. are made here of a mixture of sand and clay found in the river. Admiral Blake was a native of this town, which suffered severely in the civil wars, when it was besieged by Fairfax, and ultimately forced to surrender, the castle being dismantled by the conqueror. The unfortunate duke of Monmouth was proclaimed king by the corporation of B., before the battle of Sedgemoor, which occurred in 1685, 5 m. s.e. of B., and in which he was defeated by the royal army. In 1880, 143 vessels, of 9099 tons, belonged to the port; and in the same year the number of vessels that cleared the port was 4227, with an aggregate burden of 237,395.

BRIDGEWATER, Francis Egerton, Duke of, styled the "Father of British Inland Navigation," youngest son of Scroop, fourth earl and first duke of B.; was b. in 1736, and succeeded his elder brother, second duke, in 1748. In 1758–60, he obtained acts of parliament for making a navigable canal from Worsley to Salford, Lancashire, and carrying it over the Mersey and Irwell Navigation at Barton by an aqueduct 39 ft. above the surface of the water, and 200 yds. long, thus forming a communication between his coal mines at Worsley and Manchester, on one level. In this great undertaking he was aided by the skill of James Brindley (q.v.), the celebrated engineer, and expended large sums of money. He was also a liberal promoter of the Grand Trunk Navigation; and the impulse he thus gave to the internal navigation of England, led to the extension of the canal system throughout the kingdom. In politics, though he took no active part, B. was a friend of the Pitt administration, and a contributor to the loyalty loan of no less than £100,000. He died unmarried, Mar. 8, 1803, and with his death the dukedom became extinct. Before he began to realize profits from his great work, B. lived in privacy, and restricted himself to the simplest fare; and after his death his great wealth was distributed among collateral branches of his family. A monument was erected to his memory in Manchester.

BRIDGEWATER, Francis Henry Egerton, Earl of, son of John Egerton, bishop of Durham, grandnephew of the first duke of B., succeeded his brother as eighth earl, Oct. 21, 1823. Educated for the church, he had previously been prebendary of Durham. He died unmarried, in Feb., 1829, and the title became extinct. By his last will, dated Feb. 25, 1825, he left £8,000, invested in the public funds, to be paid to the author of the best treatise *On the Power, Wisdom, and Goodness of God, as manifested in the Creation*, illustrating such work by such arguments as the variety and formation of God's creatures in the animal, vegetable, and mineral kingdoms, the effect of digestion, the construction of the hand of man, and by discoveries, ancient and modern, in arts, sciences, and the whole extent of literature. The then president of the royal society of London, Davies Gilbert, to whom the selection of the author was left, with the advice of the archbishop of Canterbury, the bishop of London, and a noble friend of the deceased earl, judiciously resolved that, instead of being given to one man for one work, the money should be allotted to eight different persons for eight separate treatises, though all connected with the same primary theme (see next article). B. also left upwards of £12,000 to the British Museum, the interest to be employed in the purchase and care of MSS. for the public use.

BRIDGEWATER, N. J. See page 878.

BRIDGEWATER TREATISES, eight celebrated works "On the Power, Wisdom, and Goodness of God," by eight of the most eminent authors in their respective departments, published under a bequest of the last earl of B. (q.v.), whereby each received £1,000, with the copyright of his own treatise. They are: 1. *The Adaptation of External Nature to the Moral and Intellectual Constitution of Man,* by Thomas Chalmers, D.D. (Lond. 1833, 2 vols. 8vo). 2. *Chemistry, Meteorology, and the Function of Digestion, considered with Reference to Natural Theology,* by William Prout, M.D. (Lond. 1834, 8vo). 3. *On the History, Habits, and Instincts of Animals,* by the rev. William Kirby (Lond. 1835, 2 vols. 8vo). 4. *On Geology and Mineralogy,* by the rev. Dr. Buckland (Lond. 1837, 2 vols. 8vo). 5. *The Hand, its Mechanism and Vital Endowments, as Evincing Design,* by sir Charles Bell (Lond. 1837, 8vo). 6. *The Adaptation of External Nature to the Physical Condition of Man,* by John Kidd, M.D. (Lond. 1837, 8vo). 7. *Astronomy and General Physics, considered with Reference to Natural Theology,* by the rev. William Whewell (Lond. 1839, 8vo). 8. *Animal and Vegetable Physiology, considered with Reference to Natural Theology,* by Peter Mark Rogert, M.D. (Lond. 1840, 2 vols. 8vo). All these works have since been republished by Bohn.

BRIDGMAN, Charles De Witt, D.D. See page 878.

BRIDGMAN, Frederick A. See page 878.

BRIDLINGTON, or Burlington, a sea-coast t. in the East Riding of Yorkshire (including Bridlington Quay, a port and bathing-place about 1 m. to the s.e.), 6 m. w. of Flamborough head, and 40 m. e.n.e. of York. B. is situated on a gentle slope in a recess of a beautiful bay. The country is hilly to the n., but subsides to the s. into a flat alluvial and fertile tract called Holderness. It has the aspect of an old town with narrow irregular streets. Pop. in '81, 8363. It has a considerable trade in corn, and also some soap-boiling and bone-grinding works. B. is supposed to have been the site of a Roman station. The Danes had strongholds in this vicinity for nearly 300 years, and many engagements between them and the Saxons and Normans occurred here. Great numbers of ancient tumuli or barrows still exist. An Augustine priory of immense wealth, and which subsisted for 400 years, was founded here by a grand-nephew of the conqueror, and obtained many privileges from Henry I., and also from king John. Some parts of it yet remain. In 1643, Henrietta, queen of Charles I., landed here with arms and ammunition from Holland bought with the crown-jewels. Bridlington Quay has a chalybeate mineral spring, as well as an intermitting one of pure water. B. is noted for its chalk-flint fossils. In the lacustrine deposits near B. were found, some years ago, the bones of a large extinct elk, with branching horns, measuring 11 ft. from tip to tip.

BRIDPORT, a t. in Dorsetshire, in a vale at the confluence of the Asker and the Birt, or Brit, or Bride, 16 m. w.n.w. of Dorchester, and 2 m. from the English channel. It stands on an eminence surrounded by hills, and consists chiefly of three spacious and airy streets. Pop. '81, 6790. The registered electors numbered (1881) 1070. including 15 freemen. They return one member to parliament. The chief manufactures are twine, shoe-thread, cordage, fishing-nets, and sail-cloth; and ship-building is carried on to some extent. The vicinity is celebrated for its cheese and butter. B. was a considerable town before the Norman conquest, and had a mint for coining silver. In 1873 there entered into this port 69 vessels whose tonnage was reckoned 6386; and there cleared it 36 vessels of collectively 3526 tons. On the coast near are sandy cliffs, 200 ft. high, abounding in fossils

BRIE, an old district of France between the Seine and the Marne, Meaux being the chief town. B. was and is celebrated for its cheese and grain. In old times a forest covered a great portion of the region. It was subdued by the Franks, and was a part of the kingdom of Neustria. In the 9th c., it was ruled by its own counts, but in 1361 it passed to the crown. The district is now comprised in the departments of Aisne and those adjoining.

BRIEF, in the practice of the English bar, is the name given to the written instructions on which barristers advocate causes in courts of justice. It is called a B. because it is, or ought to be, an abbreviated statement of the pleadings, proofs, and affidavits at law, or of the bill, answer, and other proceedings in equity, with a concise narrative of the facts and merits of the plaintiff's case, or the defendant's defense. But it is also used in forensic business generally, being applied, not only in the courts of law and equity, but also in all other tribunals, whether inferior or superior, original or appellate. In Scotland, the corresponding term is *memorial.* The skill of the attorney or solicitor is shown in the preparation of this important document, which should be characterized by arrangement and compression, without any material omission.

BRIEF (*ante*), an abridged statement of a suitor's case. It should contain the names, residences, and occupations of the parties; the character in which they sue or are sued, and why they prosecute or defend; an abridgment of the pleadings; a regular chronological statement in plain language of the facts; a summary of the points at issue and of the proof to be offered, with names of witnesses, or of documents in case of written evidence, etc. The form and nature of the B. is necessarily varied according to the purpose which it is to serve.

BRIEF, or Breve, **PAPAL** (Lat. *brevis,* short), a word which, in the corrupt Latinity of the early ages, was made to signify a short letter written to one or more persons

(hence the German *brief*, a letter). It is now used to denote certain pontifical writings, which, however, do not receive their name from the brevity of the composition, but from the smallness of the caligraphy. The papal B. differs from the papal bull (q.v.) in several points. It gives decisions on matters of inferior importance, such as discipline, dispensations, release from vows, indulgences, etc., which do not necessarily require the deliberations of a conclave of cardinals. Still, it is not to be confounded with the *motus proprii*, or private epistle of the pope as an individual, as its contents are always of an official character. His holiness speaks, as it were, with a kind of familiar parental of authority, and the B. is consequently superscribed *papa*, while the person to whom it is addressed is termed *dilecte fili* (beloved son). It is signed not by the pope, but by the *segretario de' brevi*, an officer of the papal chancery, with red wax, and only with the pope's private seal, the fisherman's ring; hence it concludes *Datum Romæ sub annulo piscatoris* (given at Rome under the ring of the fisherman). Like the bull, it is written on parchment, with this difference, that the bull is written on the rough side, and in ancient Gothic characters, while the brief is written on the smooth side, and in modern Roman characters.

BRIEG, a t. of Silesia, Prussia, about 27 m. s.e. of Breslau. It is situated on the left bank of the Oder, and on the railway between Breslau and Vienna, and is surrounded with walls, which have been partly converted into promenades. The streets are wide and regular, and commercially B. is a thriving town, its manufactures including linens, woollens, cottons, hosiery, ribbons, lace, leather, and tobacco. The battle-field of Mollwitz (q.v.) lies a little to the w. of Brieg. Pop. '75, 16,348.

BRIEL, BRIEL'LE, or THE **BRILL,** a fortified seaport t., on the n. side of the island of Voorne, s. Holland. It is situated near the mouth of the Maas, about 14 m. w. of Rotterdam, in lat. 51° 54′ n., and long. 4° 10′ east. B. possesses a good harbor, and is intersected by several canals. It has a pop. of (1876) 4205, the male portion of which are chiefly engaged as pilots and fishermen. B. may be considered as the nucleus of the Dutch republic, having been taken from the Spaniards by William de la Marck, in 1572. This event was the first act of open hostility to Philip II., and paved the way to the complete liberation of the country from a foreign yoke. In 1585, B. was one of the towns made over to England as security for certain advances made to the states of Holland; it was restored to the Dutch in 1616. B. was the first town of Holland, which, without extraneous aid, expelled the French in 1813. The celebrated admirals De Witt and Van Tromp were natives of this place.

BRIENNE-LE-CHATEAU, or, as it is now called, BRIENNE-NAPOLEON, a small t. in in the dep. of Aube, France, on the right bank of the river Aube, and about 14 m. n.w. of Bar-sur-Aube. It is celebrated as the place where Napoleon I. received his earliest military education, he having entered the school here in 1779, when he was 10 years old, and remained until 1784. It is also remarkable on account of the battle fought here between the French and the allies in 1814. On the 29th of Jan., Bonaparte, who had collected his forces in the vicinity of B., with a view to check the advance of the allies on Paris, attacked Blucher, who was stationed in the town, and drove him out with considerable loss. In the struggle, the town, which was chiefly composed of wood, was almost reduced to ashes. On the 30th, the contest was renewed, and Blucher was forced to retreat to Trannes. On the following day, Napoleon deployed his forces in the plain between La Rothière and Trannes, and on Feb. 1, the corps of the crown-prince of Würtemberg and count Giulay, and the Russian reserves of grenadiers, having joined Blucher, prince Schwarzenberg gave orders to renew the combat. After a sanguinary struggle, during which Napoleon, feeling the importance of the contest, exerted all his influence over his troops, led several charges in person, and frequently exposed himself to danger, victory at length declared decisively for the allies at every point. During the night of Feb. 1, and the morning of the following day, the French troops retreated from Brienne-le-Chateau. The loss on both sides was about equal, consisting of nearly 5000 killed and wounded. The allies took 9000 prisoners, and 70 pieces of artillery. This victory at B. opened the way to Paris, and led to the fall of the empire.

BRIENZ, a t. of the canton of Bern, Switzerland, beautifully situated at the foot of the Bernese Alps, on the n.e. shore of the lake of the same name, and about 30 m. e.s.e. of Bern. Its cheese is held in high repute. Pop. '70, 2605.—The lake of B., which is about 8 m. long and 2 in breadth, is formed by the river Aar, at the foot of the Hasli valley, and by the same river it discharges its surplus waters into lake Thun. The lake is situated at an elevation of 1850 ft. above the sea; its average depth is about 500 ft., but in some places it is said to have a depth of more than 2000 feet. It is surrounded by elevated mountains, the principal of which is the Rothorn, from which splendid views of the whole range of the Bernese Alps are obtained. A small steamer plies daily on the lake between B. and Interlaken, touching at the celebrated Giessbach fall every trip.

BRIER CREEK, a stream in Warren co., Ga., where, in the revolution, the Americans under gen. Ashe were defeated Feb. 27, 1779, by the English under gen. Prevost; American loss about 250; English loss, 16.

BRI'ERLY HILL, an ecclesiastical district of Staffordshire, England, 2 m. n.n.e. from Stourbridge, on the Oxford, Worcester, and Wolverhampton railway. It is a place of much activity, the district abounding in coal, iron, and fire-clay; and there are here numerous collieries, large iron-works, glass-works, brick-works, and potteries. The manufacture of steam-boilers is extensively carried on. Pop. '71, 11,046.

BRIES, a t. in Hungary on the Gran; pop. '70, 11,776. The people are stock-breeders and farmers.

BRIEUC, St., a seaport t., in the department of Côtes-du-Nord, France, situated on the right bank of the Gouet, about 2 m. from its mouth in the bay of St. B., a part of the English channel, in lat. 48° 31′ n., and long. 2° 45′ west. The town is said to owe its origin to an Irishman, St. Brieuc, who built a monastery here in the 5th century. St. B. has the ruins of an old tower that formerly defended the entrance to the river, but was partially blown up by order of Henri IV. in 1598, and a cathedral, part of which dates from the 11th century. The ramparts were destroyed in 1788, and their site has been converted into a pleasant promenade, terminating in a terrace that commands a fine view of the channel. St. B. has manufactures of woolen stuffs, linen, cotton, leather, paper, etc.; it has also ship-building yards, and a trade in agricultural produce. Pop '76, 13,683.

***BRIGADE'**, in the military service, is a group of regiments or battalions combined into one body. When a British army takes the field, it is customary for three battalions to form a *brigade*, and two brigades a *division*. Thus, at the battle of the Alma, each of the five divisions of British infantry comprised two brigades; and of these ten brigades, nine consisted of three battalions each, the tenth being somewhat stronger. It is nothing more than a temporary grouping, which can be broken up whenever the commanding officer thinks fit. The household troops, comprising the horse guards, life guards, and foot guards, are sometimes called the *household brigade*. See *Supp.*, page 878.

BRIGADE MAJOR is a military officer who exercises duties, in a brigade, analogous to those of the adjutant of a regiment. He attends to matters of discipline, and to the personal movements of the men. When regiments or battalions are brigaded, a B. M. is appointed, usually from among the captains. He conveys orders, keeps the rollster or roster, inspects guards and pickets, and directs exercises and evolutions; but he nevertheless remains on the books of a particular regiment, and returns to his regimental duties when the B. is broken up.

***BRIGADIER,** or Brigadier-General, is an officer of a regiment (usually a col. or lieut.col.), who, for a limited time and for a special service, is placed upon brigade duties. He is then a general or commander of a brigade, which usually contains his own regiment as one of the number. When the brigade is broken up, he falls back to his colonelcy, unless his services lead to his promotion to the rank of maj.gen.
See *Supp.*, page 878.

BRIGANDINE, among the articles of armor worn during the middle ages, was an assemblage of small plates of iron, sewed upon quilted linen or leather, and covered with a similar substance to hide the glittering of the metal. It formed a sort of coat or tunic. The B. was named from the *brigans*, a kind of light-armed irregular corps, employed something like the Cossacks and Bashi-bazouks of recent days, and, like them, addicted to marauding and pilfering; hence the word *brigand*.

BRIGAN'TES. See Britannia.

BRIG–BRIG'ANTINE. A brig is a square-rigged vessel with two masts. A brigantine, or hermaphrodite brig, is a two-masted vessel, with the mainmast of a schooner and the foremast of a brig. A brig's mainsail is the lowest squaresail on the mainmast, whereas the mainsail of a brigantine is a fore-and-aft sail like that of a schooner.

BRIGGS, Charles Augustus, d.d. See page 878.

BRIGGS, Charles Frederick, 1810–77; b. Mass.; a journalist and author known as "Harry Franco." He started the *Broadway Journal*, in New York, of which Edgar A. Poe became an associate editor the year following its establishment; and in 1853 he became the first editor of *Putnam's Magazine*, which he conducted for several years. At a later period he was connected with the *New York Times*. Some of his works are *The Adventures of Harry Franco*; *The Haunted Merchant*; and *The Trippings of Tom Pepper*. His latest editorial work was done upon the *Brooklyn Union* and *The Independent*, with the latter of which he was connected at the time of his death.

BRIGGS, George Nixon, ll.d., 1796–1861; b. Mass.; a lawyer and judge, member of congress, and for two terms governor of Massachusetts. He was for some time president of the Baptist missionary union.

BRIGGS, Henry, a distinguished mathematician, was b. in 1556, at Warleywood, near Halifax, Yorkshire, and studied at St. John's college, Cambridge. In 1596, he was appointed first reader in geometry at Gresham house (afterwards college), London, and in 1619 first Savilian professor of geometry in Oxford. This office he retained till the time of his death, which took place at Oxford, Jan. 26, 1631. B. made an important contribution to the theory of logarithms, of which he constructed invaluable tables. Napier the inventor had, in 1614, published a table of the so-called natural logarithms, when B. observed that another system, in which the logarithm of 10 should be taken as unity, would afford great facilities of calculation. Napier admitted the improvement

on his own system, and intended to assist in carrying the plan into effect; but died in 1618, when the whole work was left to Briggs. In the same year he published his *Chilias Prima Logarithmorum*, containing the first thousand natural numbers calculated to eight decimal places, and in 1624 published his *Arithmetica Logarithmica*, the fruit of many years of unwearied application, and giving the logarithms of natural numbers from 1 to 20,000, and from 90,000 to 101,000, with 15 places. His system of logarithms is that now commonly adopted. Leaving others to carry out his calculations, for which he had provided every facility, he next employed himself on a table of logarithms of sines and tangents, carried to the hundredth part of a degree, and to 15 places, which, with a table of natural sines, tangents, and secants, was posthumously published at Gouda, in Holland, 1633, under the title of *Trigonometria Britannica*.

BRIGHAM, Amariah, 1798–1849; b. Mass.; a physician who devoted great attention to the cause and cure of insanity. He was superintendent of the retreat for the insane in Hartford, Conn., and of the New York state asylum. While at the latter institution he gave lectures and established the *Journal of Insanity*. Among his works are *Mental Cultivation and Excitement; The Influence of Religion upon the Health and Physical Welfare of Mankind;* and *The Anatomy, Physiology, and Pathology of the Brain*.

BRIGHAMIA, plants of the lobelia family discovered in the Sandwich islands. The *B. insignis* bears sweet-scented, showy, and abundant flowers which last for several months. It is a favorite in English conservatories. The juice is said to be a specific for some cutaneous diseases.

BRIGHT, Jesse D., b. New York, 1812. Early in life he settled in Indiana as a lawyer, and became state senator and lieutenant-governor. In 1845, he was elected to the United States senate, where he served 18 years. In 1862, he was expelled from the senate for having written to Jefferson Davis as "President of the Confederate States," recommending to him a man who desired to furnish arms for the rebels. He d. 1875.

BRIGHT, John, a popular politician, first brought into notice by the anti-corn-law agitation, son of Jacob Bright, a Quaker cotton spinner and manufacturer at Rochdale, Lancashire, was b. at Greenbank, near that town. Nov. 16, 1811. In 1835, he made a foreign tour, which included a journey to Palestine, and, on his return, delivered before a literary institution at Rochdale, of which he was one of the founders, lectures on the subject of his travels, and on topics connected with commerce and political economy. When the anti-corn-law league was formed in 1839, he was one of its leading members, and, with Mr. Cobden, engaged in an extensive free-trade agitation throughout the kingdom. In the spring of 1843, he offered himself as a condidate for the representation of Durham, and, though at first unsuccessful, he became, in July of the same year, M.P. for that city. At all times an animated and effective speaker, B. was incessant, both at public meetings and in parliament, in his opposition to the corn laws, until they were finally repealed. In 1845, he obtained the appointment of a select committee of the house of commons on the game laws, and also one on the subject of cotton cultivation in India. An abridgment of the evidence taken before the former, published in one volume, contained from his pen an *Address to the Tenant Farmers of Great Britain*, strongly condemning the existing game laws. At the general election of 1847, he was elected one of the members for Mancnester. He co-operated with Mr. Cobden in the movement in favor of financial reform. On the formation of the first Derby ministry, Feb. 27, 1852, B. aided in the temporary reorganization of the corn-law league, in favor of the principles of free trade; and at the general election which followed, was re-elected for Manchester. A member of the peace society, and strenuously opposed to the war with Russia in 1854, B. was one of the meeting of the society of Friends, by whom a deputation was sent to the emperor Nicholas to urge upon him the maintenance of peace; and in 1855 he energetically denounced the Crimean war. A severe illness compelled him to withdraw for a time to the continent, and in his absence he was rejected by Manchester. Elected in 1857 for Birmingham, he seconded the motion against the second reading of the conspiracy bill, which led to the overthrow of lord Palmerston's government. His name then became chiefly associated with the movement for reforming the electoral representation, which resulted in the act of 1867. In 1868, he accepted office as president of the board of trade, but in 1870 was again obliged to retire, in consequence of severe illness. His health having been partially restored, he held office in 1873–74 as chancellor of the duchy of Lancaster. A collection of his *Speeches* was published in 1868.

BRIGHT, John Morgan, ll.d. See page 878.

BRIGHT, Richard, 1789–1858; an English physician educated at Edinburgh; practiced with great success in London, becoming physician to Guy's hospital. His specialty was morbid anatomy and the connection between morbid symptoms and alterations of structure of the internal organs. He discovered that an albuminous condition of the urine, accompanied with dropsical effusions, was dependent on a peculiar degeneration of the kidneys, whence the disease in which these conditions occur was called Bright's disease. His publications on this topic were made in 1836–40.

BRIGHTENING, in calico-printing, is the operation of rendering the colors of printed fabrics more bright or brilliant, by boiling them in solutions of soda and other materials.

BRIGHTON, a former t. in Middlesex co., Mass., 4 m. w. of Boston on the Albany and Boston railroad; pop. '70, 4957. It is famous as the great cattle-market of Boston and the east. It has besides some manufacturing establishments. Since 1873 it has been a part of Boston.

BRIGHTON, originally Brighthelmstone, a t. and a celebrated watering-place on the sea-coast of Sussex, 50½ m. s. of London. It is built on a slope ascending eastward to a range of high chalk-cliffs (backed by the South Downs), bounding the coast as far as Beachy Head; to the west, these hills recede from the coast, and leave a long stretch of sands. Anciently, Brighthelmstone was a mere fishing-village on a level under the cliff; and more than once it was burnt and plundered by French marauders. It was fortified by Henry VIII., and more strongly by Elizabeth; but the sea proved more dangerous than the French, and now washes over the site of the village of those days. The inroads of the sea in 1699, 1703, and 1705, undermined many cliffs and destroyed many houses. Its further inroads are prevented by a sea-wall of great strength (60 ft. high, 23 ft. thick at the base, and 2 m. long), extending along the cliffs, and built at the cost of £100,000. The writings of Dr. Russel, a celebrated physician of George II.'s time, first drew public attention to B. as an eligible watering-place, and the discovery of a chalybeate spring in the vicinity increased its popularity. The visit of the prince of Wales in 1782, and his subsequent yearly residence there, finally opened the eyes of the fashionable world to its immense attractions, and B. thenceforth became the crowded resort of a health-seeking population. Its progress has been very rapid, and the town is still steadily increasing. B. is for the most part extremely well built, as becomes a favored retreat of wealth and aristocracy. It mostly consists of new and elegant streets, squares, and terraces. The hotels are magnificent. A range of splendid houses fronts the sea for nearly 3 m., including the famous sea-wall, and the beach is easily accessible by gaps in the chalk-cliffs. Formerly, trees were a great rarity in B.; but within the last thirty years they have been planted both in and around the town, and are now to be seen of considerable size in the North Steyne Inclosures, the Level, and the Queen's park. Pop. in 1801, 7339; in '21, 24,429; in '51, 65,569; in '81, 107,528. B. returns two members to parliament. The population is greatly increased during the fashionable season by the influx of visitors. The town was incorporated in 1854. Living and house-rent are about a third higher than in London. Near the center of the town is the pavilion or marine palace, a fantastic oriental or Chinese structure, with domes, minarets, and pinnacles, and Moorish stables, begun for the prince of Wales in 1784, and finished in 1827. It is now the property of the corporation of B., and with its fine pleasure-grounds of above seven acres, it is devoted to the recreation of the inhabitants. It stands in the Steyne, an open space between the e. and w. parts of the town. The marine parade, a fine terrace, extends about a m. along the margin of the cliff, between the Steyne and Kemp town, a handsome district on the east. Westward, there is a similar parade or promenade, extending a great length in front of the more modern part of the town, and here there is daily a large and fashionable concourse. There are two piers—a chain pier on the e., opposite the marine parade, and a broad wooden pier on piles on the w.; both are used for promenading. A magnificent aquarium, 715 ft. in length, was opened in 1872. B. has no maritime trade. It is reputedly a town for recreation and sea-bathing Its only defect is a want of trees to shade the promenades; the sea-breeze being adverse to the growth of trees. B. possesses several large public hotels, and is more particularly noted for its excellent private hotels or boarding houses, locally known as "mansions." B. is connected with London, and also with the towns along the coast, by railways. From its salubrity, the town abounds in boarding-schools.

BRIGHT'S DISEASE (of the kidneys), so called after the English physician, Dr. Bright, who first investigated its character, consists of a degeneration of the tissues of the kidney into fat, and will be better understood after the anatomy of the organ has been studied. Suffice it to say now, that this degenerated condition impairs the excreting powers of the organ, so that the urea is not sufficiently separated from the blood. The flow of the latter, when charged with this urea, is retarded through the minute vessels, congestion ensues, and exudation of albumen and fibrin is the result. When we apply heat to the urine from a kidney so affected, it becomes opaque, showing that it contained *albumen* (q.v.); and on examining a drop of it under the microscope, we observe the exuded lymph mixed with epithelium in the form of casts of the small ducts of the diseased organ. The patient presents a flabby, bloodless look, is drowsy, and easily fatigued. The disease may succeed any of the eruptive fevers, and is frequently associated with enlargement of the heart.

The *causes* of this terrible malady are any which cause congestion of the kidneys—indulgence in strong drinks, long-continued suppuration, exposure to wet and cold, the exanthematous fevers, and pregnancy. The indications for *treatment* are, to remove any of those causes which may be present, rectify the other secretions, relieve any temporary congestion of the kidneys, at the same time endeavoring to increase the number of red blood globules by the administration of iron and vegetable bitters. And in the advanced stages, when the blood is poisoning the nervous centers, attempts should be made to restore the secretion of urine by administering diuretics (q.v.), by giving hydrochloric

and vegetable acids, sponging the patient with vinegar, and relieving the congestion of the brain by purgatives and local bleeding. See ALBUMINURIA.

BRIGITTINES, or ORDER OF OUR SAVIOUR, founded in 1344, as a branch of the Augustinians, by St. Brigida or Brigitta, of Sweden. There were both monks and nuns who inhabited contiguous buildings, but were said never to see each other. Temporal affairs were supervised by the nuns; spiritual by the monks. The northern kingdoms of Europe had monasteries of this order, but the reformation swept them away. Henry V. founded one house near London; Henry VIII. suppressed it; Mary re-established it; and Elizabeth finally suppressed it. There are now no monks of the order. A few convents existed in 1860 in Bavaria, Poland, and elsewhere.

BRIGNOLES, a t. in the department of Var, France, beautifully situated in a fertile valley, surrounded by forest-clad hills, and watered by a stream called the Calami, about 22 m. w.s.w. of Draguignan. B., which is a very salubrious place, has manufactures of broadcloth, silk twist, soap, leather, pottery, etc.; and a trade in wines, brandy, olives, and prunes. Pop. '76, 5164.

BRIGNOLI, PASQUALE. See page 878.

BRIHUE'GA, a t. of New Castile, Spain, 20 m. e.n.e. of Guadalajara, is situated on the Tajuña, and was formerly surrounded by walls, of which traces still exist. The remains of an old Moorish fortress now serve as a cemetary. B. has manufactures of woolens, linen, glass, and leather. Pop. 4500. Here, in 1710, during the war of the succession, the English general Stanhope, owing to the dilatoriness of his allies in affording him support, was defeated by the Duke de Vendôme, and compelled to surrender, with all his force, amounting to about 5500 men.

BRIL, the name of two Dutch painters.—MATTHÆUS B., b. at Antwerp, 1550, went during his youth to Italy, and, under the patronage of pope Gregory XIII., painted several frescos in the Vatican. He was also distinguished as a historical and landscape painter. He died in 1584. His more celebrated younger brother, PAUL B., b. 1554 or 1556, received instruction under Matthæus in Rome, and soon excelled his master. His pieces were at first conceived in the fantastic style which then prevailed; but gradually his style increased in power and beauty, until it exerted a striking influence over landscape-painting. The works of his riper age exhibit high poetical qualities, and a fine appreciation of the effects of light in the sky, which have been described as but little inferior to those of his great successor, Claude Lorraine. They have a character of solemn rest and calmness, and at times even an elegiac tone of melancholy, which well accords with representations of the glories of fallen Rome. A collection of excellent landscapes by B. is found in the palace Rospigliosi in Rome, and two beautiful landscapes enrich the gallery of the Pitti palace, Florence. Besides landscapes, B. painted scenes from Biblical history; among them, the "Tower of Babel," now in the Berlin museum. Other pictures by B. are found in the galleries of Munich, Vienna, and the Louvre. He died at Rome in 1626.

BRILL, *Rhombus vulgaris*, a fish of the same genus with the turbot (q.v.), found in considerable abundance on some parts of the British coasts, and common in the markets of the larger towns. It resembles the turbot more than any other British species of this genus, but is at once distinguished by its inferior breadth, which (excluding the fins) is only equal to half its entire length; by the want of tubercles on the upper surface; by a few of the most anterior rays of the dorsal fin being elongated beyond the membrane; and by the coloring, which is reddish sandy-brown on the upper side, varied with darker brown and sprinkled with white pearly spots, the under side being (as in the turbot) white. The B. is taken both in sandy bays and in deep water. Although considered very inferior to the turbot, it is yet much esteemed for the table. It seldom or never attains so great a size as the turbot, rarely exceeding 8 lbs. in weight.

BRILLAT-SAVARIN, ANTHELME, 1755–1826; a French author, deputy in the states-general in 1789; judge of the court of cassation in 1792; the next year mayor of Bellay, but obliged to fly from the revolution. He came to New York, where he lived for three years, teaching French and playing in the orchestra of a theater. He returned to France in 1796, and under the consulate again became a judge. He wrote on political economy, and on the archæology of the department of Ain, but is best known by his *Physiology of Taste*.

BRILLIANT is a popular name given to the diamond when cut in a particular way See DIAMOND.

BRIMSTONE (Saxon *brenne-stone*, a stone that burns) is the commercial name for sulphur (q.v.), in sticks or rolls.

BRIN'DISI (the ancient *Brundisium* or *Brundusium*), a seaport t. of southern Italy, in the province of Lecce, is situated on a small promontory in a bay of the Adriatic sea, about 45 m. e.n.e. of Taranto. B. is a city of very great antiquity. It was taken from the Sallentines by the Romans 267 B.C., who some 20 years later established a colony here. The town, partly owing to the fertility of the country, but chiefly on account of its excellent port—consisting of an inner and outer harbor, the former perfectly landlocked, and capable of containing the largest fleets and of easy defense on account of its narrow entrance, and the latter also very well sheltered—rapidly increased in wealth and

importance. It soon became the principal naval station of the Romans in the Adriatic. In 230 B.C., B. was the starting-place of the Roman troops that took part in the first Illyrian war; and from this point the Romans nearly always directed subsequent wars with Macedonia, Greece, and Asia. And when the Roman power had been firmly established beyond the Adriatic, B. became a city second to none in south Italy in commercial importance. Horace, who accompanied Antony in a hostile movement on B. in 41 B.C., has made the journey the subject of one of his satires (*Sat.* i. 5). Virgil died here in 19 B.C., on his return from Greece. The city appears to have retained its importance until the fall of the empire, but it suffered greatly in the wars which followed. When the Normans became possessed of it in the 11th c., the Crusaders made it their chief port for embarkation to the Holy Land; but with the decline of the crusades, B. sank into comparative insignificance as a naval station. The city subsequently suffered greatly from wars and earthquakes. The principal buildings are the cathedral, where the emperor Frederick II. was married to Yolanda in 1225; and the castle, commenced by Frederick II., and finished by Charles V. The district around B. is still remarkable for its fertility, olive oil being produced in large quantities. Some years ago, B. was constituted an entrepot for foreign goods. Since the establishment of the overland route to India, B. has greatly increased, being the most convenient point of departure for the east from northern and central Europe. The extensive and well-sheltered harbor has undergone great improvement, and a substantial bulwark has been built across the n. arm to prevent it from being filled with sand. In 1874, 939 vessels, of 380,069 tons, cleared the port. Pop. 9105.

BRINDLEY, JAMES, an eminent English mechanic and engineer, b. in Thornsett, near Chapelen-le-Firth, Derbyshire, in 1716. Apprenticed at 17 to a millwright, he afterwards became an engineer, and in 1752 showed great ingenuity in contriving a water-engine for draining a coal-mine. A silk-mill on a new plan, and several others of his works, recommended him to the duke of Bridgewater (q.v.), who employed him to execute the canal between Worsley and Manchester. Thenceforth he devoted his great skill and genius to the construction of navigable canals; commenced the Grand Trunk, and completed the Birmingham, Chesterfield, and others. Once, when under examination before a committee of the house of commons, being jocularly asked for what purpose he supposed rivers to have been created, he is said to have replied: "Undoubtedly to feed navigable canals." He died in 1772.

BRINE is the term applied to water highly impregnated with common salt, and BRINE SPRINGS are those natural waters containing much salt, which in many parts of the world gush out from fissures in the ground. See SALT

BRINE-SHRIMP, *Artemia salina*, a small crustacean, of the order *branchiopoda* (q.v.), which, unlike the greater number of animals of that order, is an inhabitant not of fresh but of salt water, and is indeed remarkable, because it is to be found in myriads swimming about in the brine of salt-pans previous to boiling, when, having been concentrated by exposure to sun and air for about a fortnight, it destroys the life of almost all other marine animals. The full-grown B. is about half an inch long. The little animal is almost transparent, and is extremely active and graceful in its movements. The workmen at salt-pans so confidently ascribe to it the rapid clearing of the brine in which it occurs, that when it does not appear in their *salterns*, they transport a few from other salterns. They multiply with extraordinary rapidity.

BRINJAREE DOG, a rough-haired or long-haired variety of greyhound (q.v.), used in the Deccan, and said to be the best of the hunting-dogs of India. It is said to be superior in size and strength to the Persian greyhound, but not to be equal to the British greyhound in swiftness. It is generally of a yellowish or tan color.

BRINVILLIERS, MARIE MARGUERITE, Marquise de, notorious as a poisoner in the time of Louis XIV., was the daughter of Dreux d'Aubray, lieutenant of Paris, and received a careful education. In 1651, she was married, while still young, to the marquis de Brinvilliers. This nobleman seems to have been a gay and careless spendthrift, who allowed his wife to do very much as she pleased. He even introduced to her a young officer named Jean Baptiste de Gaudin, Seigneur de St. Croix, who was exceedingly handsome, and who inspired her with a violent passion. Her easy husband, however, was wholly indifferent to his wife's conduct; but her father, who seems to have had a stricter sense of duty, caused St. Croix to be arrested and imprisoned in the Bastile. It was here the latter learned the art of preparing poisons, from an Italian, and on his release he imparted his fatal knowledge to his mistress, who, during his incarceration, had affected the greatest piety, spending most of her time in visiting the hospitals and in attending the sick. The marchioness now resolved to destroy her father. St. Croix eagerly abetted her, in the hope of obtaining a portion of the paternal inheritance; but in order to test the efficacy of the poison, she tried its effects upon the invalids of the *hôtel Dieu*. Having satisfied herself, she commenced operations on her parent, kissing and poisoning him continually for eight months, until her diabolical patience was exhausted, and she was at last induced to administer a very violent dose. He died, and no one suspected the marchioness. With St. Croix's assistance, and that of a domestic servant, Jean Amelin, *alias* Chaussée, she next poisoned, with the same fearful indiffer-

ence to crime, her two brothers and her sisters; her object being to find means of supporting her extravagant style of living with her paramour. Several times she attempted to poison the marquis, her husband; but he escaped, and, as was said, by means of antidotes given by St. Croix, who dreaded that he should be compelled to marry the widow. St. Croix died suddenly in 1672—his glass mask having fallen off while he was engaged in preparing a poison—leaving documents inculpating the marchioness. She was also accused about the same time by her accomplice Chaussée, who being arrested, confessed all, and was condemned to be broken alive. The marchioness escaped to England; afterwards she traveled into Germany, and next went to Liege, where she took refuge in a convent. From this, however, she was craftily decoyed by an officer of justice disguised as an abbé, and conveyed to Paris. Among her papers was found a general confession of her crimes, including the above-mentioned murders, and many others. One strange confession stated that, out of pity for a virtuous young lady who had been imprisoned in a convent, the marchioness had poisoned a whole family! It is a singular fact, that this infamous woman was a bigot in her religious tenets, and was quite exemplary in her attendance at church. At her trial in Paris, she at first denied all charges brought against her, and pretended that the "general confession" had been written during the insanity caused by a fever; but after being put to the torture, she made a full confession, and was beheaded, July 16, 1676. Her career had excited such terror in France, that Louis XIV. instituted a distinct tribunal, the *chambre ardente* (q.v.), to investigate cases of poisoning by the "succession powder" used by the marchioness.

BRION, Gustave, b. 1824; a French painter. Among his chief works are "The Potato Harvest during the Inundation," "A Funeral in the Vosges," "A Marriage in Alsace," and "The Sixth Day of Creation," the latter, exhibited in New York. D. 1877.

BRION, Luis, 1782–1821; an admiral in the Colombian service, who served in the army of Holland, studied navigation in the United States, and in 1811 was appointed captain of a frigate in the service of Caraccas. Subsequently he fitted out a fleet by his own exertions and drove the Spaniards from the island of Margarita. He was also distinguished in the conquest of Guiana, and at Cartagena and Santa Marta.

BRIOUDE, a t. of France, in the department of Haute-Loire, situated near the left bank of the river Allier, about 29 m. n.w. of Le Puy. It occupies the site of *Brivas*, a town of the ancient Averni. Its principal buildings are the college and the church of St. Julien, founded in the 9th c., on the site of a still more ancient edifice erected on the spot where the saint was martyred. B. has manufactures of linen and woolen, and a trade in the agricultural produce of the district. Lafayette was born here. Pop. '76, 4643.

BRISBANE. 1. B., an inland co. of Queensland, about 120 m. n.n.w. of Sydney.—2. B., a seaport, the capital of Queensland, about 640 m. n. of Sydney. It stands near the mouth of a river of its own name, which falls into Moreton bay. Regular steam communication is kept up with Sydney and other Australian ports. B. possesses some fine buildings, among the chief of which are the houses of legislature, which cost £100,000, the post-office, and the viceregal lodge. There are 31 churches. Pop. '76, 26,911.—3. B., the river just mentioned. It rises in the main ridge which divides the rivers of the interior from those of the coast.—All the foregoing are named after the subject of the succeeding article.

BRISBANE, General Sir Thomas Makdougal, a distinguished soldier and astronomer, was b. at Brisbane, the hereditary seat of his family, near Largs, Ayrshire, July 23, 1773. At the early age of 16 he entered the army as an ensign, and in the following year, when quartered in Ireland, he formed an intimate acquaintance with Arthur Wellesley, afterwards duke of Wellington. With a company he had raised in Glasgow in 1793, B. took part in all the engagements of the campaign in Flanders; and in the West Indies, to which he was sent in 1796, he greatly distinguished himself under sir Ralph Abercromby. He afterwards served in the West Indies as col. of the 69th; and in 1812 obtained command of a brigade under the duke of Wellington in Spain. For his conspicuous bravery at the battle of the Nive he received the thanks of parliament. When Napoleon abdicated, B. was sent in command of a brigade to North America, from whence he was recalled in 1815, but too late to admit of his being present at Waterloo. In 1821, B., on the recommendation of his friend the duke, was appointed governor of New South Wales, a position he held for four years, during which time he introduced many wise reforms, especially in penal treatment; secured at his own expense good breeds of horses for the colony; promoted the cultivation of the sugar-cane, vine, tobacco, and cotton; and left at the close of his administration—which was marked by perfect tolerance and protection of all classes of Christians—50,000 acres of cleared land where he had found only 25,000. But high as B. ranks as a soldier and administrator, as a man of science he holds a still higher place. While in Australia, he catalogued no less than 7385 stars, for which great work—known as "the Brisbane Catalogue of Stars"—he received the Copley medal from the royal society. On his return to Scotland, he had an astronomical observatory established at his residence at Makerstoun, and devoted himself entirely to scientific pursuits. He entered warmly into the plans of the British association for ascertaining the laws of the earth's magnetism, and in 1841 had a splendid magnetic observatory

erected at Makerstoun, the observations made there filling three large volumes, published in the *Transactions of the Royal Society of Edinburgh*, of which he was president, having been elected on the death of sir Walter Scott. He founded two gold medals for scientific merit—in the award of the royal society, and in the society of arts. He d. Jan. 27, 1860.

BRISBANE, William H., M.D. See page 878.

BRISCOE: co. Tex. See page 878.

BRISSON, Henri. See page 878.

BRISSOT, Jean Pierre, one of the first movers in the outbreak of the French revolution, and afterwards numbered among its victims, was b. at Chartres in 1754, and educated for the bar. After completing his studies at Paris, he went into the office of a procurator, but quickly abandoned the legal profession for the more congenial one of authorship. From his earliest years he had devoted himself with passionate eagerness to literary studies, especially history, economy, and politics, and, among the other lingual accomplishments, acquired a thorough mastery of English. His first work, *Théorie des Lois Criminelles* (1780), gained the approbation of Voltaire and D'Alembert, and was followed by his *Bibliothèque des Lois Criminelles*, which established his reputation as a jurist. Having removed to London, he there started a learned journal, under the title *Lyceum*, for which, however, he found no adequate support. He therefore returned to Paris, and soon afterwards was imprisoned in the Bastile, on a charge of having written against the queen a brochure, which, in fact, was penned by the marquis de Pelleport. After four months in the Bastile, he was liberated through the intervention of Madame de Genlis and the duke of Orleans. B. continued to write tracts on finance, etc., but his love of freedom and vehement hatred of despotism again involved him in danger, and, to escape from a *lettre-de-cachet*, he was once more compelled to retire to England. He afterwards visited North America, as representative of the *Société des Amis des Noirs*. On his return to France, he zealously assisted in the outbreak of the revolution, and was in consequence elected by the citizens of Paris their representative in the constituent assembly, where he exercised a predominant influence over all the early movements of the revolution. He also established a journal, called *Le Patriote Français*, which became the recognized organ of the earliest republicans; and, through his superior knowledge of politics and the usages of constitutional countries, he gathered round him all the young men of talent and spirit who were opposed to the court-theory of absolute sovereignty. It thus happened that, without his being formally considered the head of a party, all the movements of the early revolutionists were profoundly influenced by him, and he incurred the bitter hatred of the court reactionists, who affixed the nickname of Brissotins to all the advocates of reform. Afterwards, the Brissotins formed the Girondist party. In the convention, B. was representative of the department Eure-et-Loir. Here his moderation made him suspected as a friend of royalty, as he opposed the "men of September" and the trial and condemnation of the king. When Louis XVI. heard his doom pronounced, he exclaimed: "I believed that Brissot would have saved me!" But B. was weak enough to imagine that the best way to save the king would be to vote first for his death, and then appeal to the nation. B. and his party, which was perhaps the purest in principle and the weakest in action, ultimately fell before the fierce accusations of the Mountain, or Jacobin party, which believed, or at least pretended to believe, that the virtuous B. had received money from the court to employ against the revolution. With 20 other Girondists, B. suffered death under the guillotine, Oct. 30, 1793.

BRISTED, Charles Astor, son of the Rev. John Bristed, grandson of John Jacob Astor, b. N. Y., 1820. He was educated at Yale and at Trinity college, Cambridge, Eng., graduating in 1845. For several years he was a contributor to periodical literature over the signature of "Carl Benson." He was one of the first board of trustees of the Astor library. Among his collected works are: *The Upper Ten Thousand of New York; Selections from Catullus; Five Years in an English University; The Interference Theory of the Government;* and *Letter to Horace Mann*, in which he replied to attacks upon John Jacob Astor and Stephen Girard. He d. 1874.

BRISTED, John, 1778–1855; b. England; clergyman and author, who practiced law in New York, and married John Jacob Astor's daughter. In 1829, he became rector of an Episcopal church in Rhode Island. He published *Edward and Anna*, a novel; *The Resources of the United States; Thoughts on Anglican and American Churches*, etc.

BRISTLES, the strong hairs growing on the back of the hog and wild-boar, and extensively used in the manufacture of brushes, and also by shoemakers and saddlers. They form an important article of British import, between 2 and 3 million pounds being annually imported, chiefly from Russia and Germany; but they are also obtained from France and Belgium, and small quantities of inferior quality have recently been received from China. From Russia, the average annual value of B. imported into Britain is £300,000, Siberia alone supplying about £150,000. Russian B. vary in value from £6 to £60 per cwt. From Germany, about £100,000 worth per annum is received, varying from £6 per cwt. to £35 per cwt. From France and Belgium, about £20,000, varying in value from 2*s.* to about 4*s.* 6*d.* per pound. The quality of B. depends on the length, stiffness, color, and straightness—white being the most valuable. The best bristles are produced by pigs that inhabit cold countries. The Russian hog is a long, spare animal, and the thinner the hog, the longer and stiffer the bristles. When the Russian hog is sent to the south and fattened, the B. become soft, and of course depreciated in value. In the summer, the hogs are driven in herds through the forests, to feed on soft roots, etc., when

they shed their B. by rubbing themselves against the trees. The B. are then collected, sewed up in horse or ox hides, and sent to fairs, whence they find their way, through agents, to all countries.

BRISTOL, a co. in s.e. Mass., bordering on Rhode Island and the ocean, 517 sq.m.; pop. '75, 131,087; in '80, 139,121. It is drained by Pawtucket and Taunton rivers, and has nearly 20 m. of sea-coast. There is considerable agriculture, but the main business is manufacturing of cotton, wool, etc. There are four railroads intersecting the various parts of the county. Co. seat, Taunton.

BRISTOL, a co. in e. Rhode Island, bordering on Mass.;25 sq. m.; pop. '80, 11,394. It has an uneven surface, with some fine scenery, and fertile soil. Two railroads traverse its territory. Co. seat, Bristol.

BRISTOL, a t. in Hartford co., Conn., 18 m. w.s.w. of Hartford, on the Fishkill railroad; has great clock factories, foundries, machine-shops, etc. Pop.'80, 5347.

BRISTOL, a t. in Bucks co., Penn., on the Delaware, about 20 m. above Philadelphia, opposite Burlington, N. J.; pop. '80, 5273. It is at the terminus of the Delaware branch of the Pennsylvania canal, and has railroad connection with New York and Philadelphia.

BRISTOL, a t. in Rhode Island, on the peninsula dividing Mt. Hope and Narraganset bays, 16 m. s.e. from Providence; pop. '70, 5302; in '80, 6028. The town is interesting as the site of the residence of king Philip, the great Narraganset chief, who was slain here in 1676. B. is a port of entry, has a large manufacturing interest, and is much frequented as a place of summer resort. In the revolutionary war it was bombarded by the English, and the greater part of the village was burned.

BRISTOL, an important maritime city in the w. of England, long. 2° 35′ 28″ w., lat. 51° 27′ 6″ n., upon the rivers Frome and Avon, and partly in the counties of Gloucester and Somerset, joined with the former for ecclesiastical and military purposes, but otherwise a city and co. in itself. The ratable value in 1872 was £851,048. The ancient portion of B. consists almost entirely of shops, warehouses, offices, manufactories, and other commercial buildings. The streets are, with few exceptions, narrow and irregular; but great improvements have been effected in them recently at a cost of half a million sterling, and there are many handsome shops, and other buildings of a superior character. Among the latter may be especially mentioned the banking-house of the West of England company, the assize court and guild hall, bank of England, general hospital, Colston hall, and Victoria rooms. A great central terminus has been erected for the various railways. The most remarkable modern structure, however, is the suspension bridge over the Avon, at Clifton, which is 702 ft. in span, and 245 ft. above high-water. Among the ancient buildings are the church of St. Mary Redcliffe, the cathedral, and Temple church, remarkable for its leaning tower. Some remains still exist of the ancient castle and walls, traces of British encampments at Clifton and Leigh, and considerable Druidic vestiges at Stanton Drew. The modern portions of B., including Clifton, Cotham, Redland, etc., consist of handsome residences, in squares, terraces, crescents, and detached villas, and some creditable specimens of architecture in churches, chapels, assembly and club rooms. The population of B. proper was, in 1871, 62,662, and of the suburban districts, 141,378—total, 204,040, steadily increasing; 1881, included in the municipal boundary, 206,503. The floating harbor and quays extend for more than a mile through the city, and are formed by embanking and locking the old courses of the rivers, which now flow through a new channel cut at a cost of about £600,000. There were entered inwards with cargoes during the year 1880, 9745 vessels, with a tonnage of 1,228,742, engaged in the foreign and coasting trade. The clearances outwards show 9408 vessels and 1,215,082 tons. The customs duties on imports produced in the year 1876 £685,538, against £1,030,132 in 1872. The chief trade is with Canada and the was £7,279,147, against £7,057,036 in 1872. The chief trade is with Canada and the United States, West Indies and South America, Portugal, the Mediterranean, Russia, Mauritius, Turkey, France, and w. coast of Africa. The principal exports are iron, tin-plate, copper and brass, coal, salt, and manufactured goods, to the annual value of about £400,000. The manufactures are chiefly cotton goods, glass, refined sugar, earthenware, lead, chemicals, leather, and floor-cloths. The ship-building yards have the reputation of turning out excellent sea-going vessels. The *Great Western*, the pioneer of steam-communication across the Atlantic, the *Great Britain*, and the ill-fated *Demerara*, were built here. The railways terminating in Bristol are—the Great Western from the e.; the Midland from the n., with a branch to Bath; the Bristol and Exeter from the w.; the North Somerset from the s.; the Great Western line communicating with South Wales, and short branches to Avonmouth and Portishead. B. returns two members to the house of commons; the number of electors was, in 1880, 25,000. The municipal government is vested in a mayor, 16 aldermen, and 48 town-councilors, a lord-lieutenant, and lord high steward. The police arrangements are efficient, and the city has a large jail which is about to be reconstructed on a new site. The benevolent institutions of B. are numerous and well supported. The most important are the infirmary, the general hospital, the blind asylum, orphan asylum, asylum for deaf mutes, alms-houses, reformatories, etc., and the extraordinary Ashley Hill asylum, for 2050 orphans, built and main-

tained without any provision for meeting expenses, except the unsolicited contributions that happen to be sent to it. Among charitable institutions must also be reckoned the well-endowed Colston, city, and Red Maids schools, and other free schools. For the better classes, the educational establishments are Clifton college and the grammar school, and many proprietary and private schools; there are also a medical school, fine arts academy, and trade school. Of places of worship in B., 57 belong to the church of England, 29 to Wesleyan communities, 24 to Independents, and about 36 to other sects. The first records of the history of B. speak of it under the ancient British name of Caeroder; it then became a stronghold of the Romans; on their departure, was again occupied by the Britons, until, in 584, the Saxons drove them out, and giving it the name of Brightstowe or Bricstowe, made it a thriving place of trade—aboriginal slaves being a principal item in the commerce. It was sacked by the Danes. Henry III. gave it the rights of a corporate town; Edward III., those of a city and county in itself. In 1247, the parishes of Redcliffe, Temple, and St. Thomas were added to Bristol. During the civil wars, it was alternately taken by royalists and parliamentarians, and by the latter the castle and fortifications were razed. It afterwards became the principal port for trade with the West Indies, and carried on a flourishing business in negro slaves. In 1793, the "bridge riots" occurred. In 1804 the docks were begun, and in 1809 they were opened to shipping. In 1831, the "reform bill riots" resulted in the destruction of the bishop's palace, custom-house, excise-office, jail, toll-houses, a number of private residences, and several lives. The bill itself, by the addition of Clifton, etc., gave the city its present municipal boundaries. Among the names of note identified with the history of B. are those of the Fitzhardinge family; William of Worcester; Canynge, the great merchant and restorer of Redcliffe church; Colston and Whitson, the merchants and philanthropists; Sebastian Cabot, the navigator, said to have anticipated the discovery of America by Columbus; the poets Southey and Chatterton; Lawrence and Baily, artists; Sydney Smith, canon of Bristol cathedral; Robert Hall, Coleridge, and Hannah More; the Misses Porter; Dr. Prichard, Dr. Carpenter, and Miss Mary Carpenter.

BRISTOL BAY, an arm of the Pacific ocean, in Russian America, lying immediately to the n. of the peninsula of Alaska. B. B. receives the waters of two considerable lakes, which, communicating with each other, offer an opening into the interior.

BRISTOL BRICK, or Bath Brick, formerly made only in Bristol, Eng., but now made in New Hampshire and other parts of the United States. It is composed of fine-grit sand, and used mainly for cleaning and polishing steel surfaces.

BRISTOL CHANNEL, an inlet of the Atlantic ocean, in the s.w. of England, between South Wales on the n., and Devon and Somerset shires on the s.; or it may be regarded as an extension of the estuary of the river Severn. It is about 80 m. long and 5 to 48 m. broad, the greatest breadth being between St. Gowan's head and Hartland point, its most western and external points, this line passing through Lundy isle. It is the largest inlet or estuary in Britain, having a very irregular coast-line of 220 m., and receiving a drainage of 11,000 sq. miles. The chief rivers which flow into it are the Towy, Taff, Usk, Wye, Severn, Avon, Axe, Parrot, Taw, and Torridge. The tides in it rise to an extraordinary height—at Bristol, 35 ft.; at King's road, 40; and at Chepstow, sometimes 70. The rapid flow of the tides meeting the currents of the rivers produces, in the narrow parts of the channel, and in the mouths of one or two of the rivers which enter it, the phenomenon of the *bore,* the tide advancing like a wall of water sometimes 6 to 9 ft. high. The chief bays and harbors are, on the n., Caermarthen and Swansea bays, Cardiff roads, the mouths of the Usk and Wye, and the Severn estuary; and on the s., Bideford or Barnstaple, Morte, Ilfracombe, Combe Martin, Minehead, Porlock, and Bridgwater.

BRISTOL, John Bunyan. See page 878.

BRISTOW, Benjamin H., b. Ky., 1833; practiced law until the commencement of the civil war, when he volunteered and served in the union army, rising to col. On the organization of the department of justice by the federal government he was appointed solicitor-general, in 1873 attorney-general, and 1874–6 secretary of treasury.

BRISTOW STATION, a village in Virginia, 4 m. s.w.s. of Manassas Junction, where two engagements took place during the rebellion—one Aug. 27, 1862, closed by darkness, and indecisive; and one Oct. 14, 1863, when the Confederates, who made the attack, were repulsed.

BRIT, *Clupea minima* (Peck), a species of herring, very small, found in great abundance at certain seasons off the New England coast, where it serves as food for bluefish. It is seldom more than 3 in. long, and is of no importance for the table.

BRITAIN, Great. See Great Britain.

BRITAIN, New. See New Britain.

BRITANNIA (perhaps from Celtic *brith* or *brit,* painted, the ancient Britons being in the habit of painting their bodies blue with woad), the ancient name of the island of Great Britain (see Britannicæ Insulæ). The Romans under Julius Cæsar (who wished to chastise the Britons for aiding the Veneti, a tribe in Gaul, against the Roman power) invaded Britain in 55 and 54 B.C, but they did not, for a hundred years afterwards, proceed with vigor to subdue the country. After a desperate resistance by the native

British princes, especially Caractacus and Boadicea, the s. half of Britain was conquered by Vespasian, and made a Roman province in the reign of Claudius, about 50 A.D. Agricola, sent by Nero in 79 A.D., consolidated these conquests, and extended the influence of Rome to the firths of Forth and Clyde, between which, in 84 A.D., he erected a chain of forts to repel the inroads of the northern Caledonians, in the line of the stone wall of Antoninus, afterwards erected, in 140 A.D., by Lollius Urbicus. Agricola was the first Roman to sail round the island, and the first Roman general to come in contact with the Caledonians, whom, under their leader Galgacus, he overthrew, in 84 A.D., at a hill called the Mons Grampius, the situation of which has not been satisfactorily determined. The Romans made many ineffectual attempts to subdue the Caledonian barbarians, and penetrated, for this purpose, through the n.e. part of Scotland as far as the Moray firth, as is attested by the remains of Roman camps and stations still existing along their line of march, and the relics of Roman art found in connection with them. Not only did the Caledonians on their own soil resist the Roman sway, but by constant inroads into the Roman territory s. of the wall of Antoninus, they so harassed the Romans themselves, that the latter were forced to abandon their conquests for 80 m. s. of that wall, and to secure permanently their remaining conquests in South Britain by a line of defensive works between the mouth of the Tyne and the Solway firth, called the wall of Hadrian (q.v.), begun by Agricola, in 80 A.D., strengthened by Hadrian in 121, and rebuilt and completed by Severus in 210 A.D. After this last date the Romans did not attempt to regain their lost provinces. Subject to these incursions of the Caledonians, the opposition of the native British princes, and the invasion of tribes from the opposite shores of the continent, the Romans held sway in Britain down to about 420 A.D., soon after which time the Saxons invaded s. Britain, and ultimately subdued it. Britain, s. of the Solway firth and the mouth of the Tyne, in the reign of Claudius, formed one Roman province under a consular legatus and a procurator. Ptolemy mentions 17 native tribes as inhabiting this tract. Toward the close of the 4th c. A.D., Roman Britain constituted a diocese in the prefecture of Gaul, and was divided into five provinces, of which the boundaries, though uncertain, are supposed to have been as follows: B. Prima, England s. of the Thames and the Bristol channel; B. Secunda, Wales; Flavia Cæsariensis, the country between the Thames, Severn, Mersey, and Humber; Maxima Cæsariensis, the rest of England to the Scottish border; and Valentia—soon abandoned by the Romans—or Scotland s. of the wall of Antoninus. At this time, also, the inhabitants of Roman Britain included Phenician, Roman, and Germanic elements, which had become incorporated with the native Britons, who were of Celtic or Gaelic descent. The Romans governed Britain by a vicarius or vicegerent resident at Eboracum (York), under whom were consulars, presidents, and other subordinate officers. To insure the obedience of the natives, at least three Roman legions—chiefly composed of Gauls, Germans, Iberians, and but few pure Romans—were stationed in Britain; viz., at Eboracum, Deva (Chester), and Isca Damnoniorum (Exeter). Under the Romans, many towns (coloniæ and municipia)—56 are enumerated by Ptolemy—arose in Britain, and diffused Roman law and civilization over the country. The towns of Eboracum (York) and Verulamium (near St. Albans) had the privileges of Roman citizenship. The Romans made many roads or streets (*strata*), of which there are still numerous remains, across the country, all centering in London. They also developed it into a corn-growing country. Druidism was the religion of the Britons at their conquest by the Romans, but the latter introduced Christianity and Roman literature into the country. There are many remains still extant of the presence of the Romans in Britain, such as camps, roads, ruins of houses, baths, flues, altars, mosaic pavements, painted walls, metallic implements and ornaments, weapons, tools, utensils, pottery, coins, sculptures, bronzes, inscriptions, etc. These remains show that the Romans wished to render their British conquests permanent, and that they had greatly improved the arts of the ancient Britons, as is evident on comparing the remains with the far ruder native antiquities of the British pre-Roman or prehistoric era, such as tumuli, barrows, earthworks, so-called Druidical monoliths and circles, cromlechs, cairns, pottery, weapons, tools, utensils, ornaments, etc. Many of the Roman remains in Britain also show that the Romans had introduced into the country the refinements and luxuries of Rome itself.

Under the term BRITANNIA, Great Britain has been personified in the fine arts as a female seated on a globe or on an insulated rock, and leaning with one arm on a shield, the other hand grasping a spear or a trident The first example of this personification is on a Roman coin of Antoninus Pius (died 161 A.D.). The figure reappears first on the copper coinage of England in the reign of Charles II. (1665); the celebrated beauty, Miss Stewart, afterwards duchess of Richmond, is said to have served as model to the engraver, Philip Roetier. The Britannia that appears on the reverse of British copper coins since 1825 was the design of Mr. W. Wyon. See COINAGE.

BRITANNIA METAL, is an alloy very largely employed in the construction of the cheaper kinds of tea and coffee pots, tea-spoons, etc. The proportions of the metals used in its manufacture are various, but the average composition in 100 parts is: tin, 85½; antimony, 10½; zinc, 3; and copper, 1. B. M. is harder than pewter (q.v.), hence vessels or spoons made of it are not so liable to lose their shape, or to be indented with a slight blow. A variety of B. M., called *queen's metal*, is also extensively used for

similar purposes, and it ranks intermediate in hardness between pewter and ordinary B. M. Queen's metal is composed of—tin, 9; antimony, 1; bismuth, 1; and lead, 1.

BRITANNIA METAL. The present composition of britannia metal at Birmingham is usually 90 tin + 8 antimony + 2 copper, without any zinc or bismuth; although some manufacturers deviate a little from this formula, by adding one or both of the metals last named. The manufacture was begun at Sheffield by Hancock and Jessop, in 1770; it reached Birmingham towards the close of the century, and made gradual progress. At first, the articles were made by stamping with dies, and soldering up into form; this being a slow operation, rendered the articles expensive. Afterwards, the curious process of *metal spinning* was introduced; and this, with the subsidiary operation of swagging, rendered a great reduction in price possible. In the spinning process, a thin sheet or piece of britannia metal is placed upon a wooden model shaped like the article to be made; the model is made to rotate in a lathe; and burnishers and other tools are employed to press the yielding metal into all the curvatures of the model. Ductility is an essential quality to the attainment of this end with the metal; how complete it is, may be seen in such articles as britannia metal teapots and dish-covers, the principal forms of which are not given by hammering, stamping, or casting, but by spinning. Besides spinning and swagging, the processes include stamping, soldering, casting, and polishing. When electro-plating was introduced, an increased use of britannia metal arose, as it forms a good ground or basis for the deposited silver. Britannia metal spoons and ladles, made by casting, stamping, and burnishing, have been nearly driven out of the market by German silver; but the former metal is more largely used than ever for hot-water jugs, soup tureens, gravy-dishes, vegetable and side dishes, dram bottles, drinking-cups, sandwich cases, wine-coolers, soap-boxes, liquor-frames, cruets, waiters, trays, etc.; and as a basis for electro-plate. Birmingham is the chief seat of the manufacture.

BRITANNIA TUBULAR BRIDGE, a railway bridge over the Menai strait, remarkable alike for its gigantic dimensions, and as being the first construction of the kind ever undertaken. With a view to facilitate communication with Ireland *via* Holyhead, the directors of the Chester and Holyhead railway in 1845 sought the aid of Mr. Robert Stephenson, the great engineer, to bridge the strait with such a structure as should admit of the safe passage of heavily laden trains without in any way interfering with the navigation of the channel. About a mile above the suspension-bridge, and nearer Carnarvon, a rock in the middle of the strait rose 10 ft. above the water at low tide; and on this site, provided by nature, it was resolved to erect a bridge in the form of a rectangular tube, composed of wrought-iron plates riveted together in a manner to combine the greatest strength with the greatest lightness. See Strength of Materials and Tubular Bridges. In the spring of 1846, the undertaking was commenced; by the 22d of June, 1849, the Britannia tower on the rock in the center of the strait was completed (height, 191 ft. 6 in. above high-water mark). Other two towers, some 18 ft. lower, were erected on each side of the Britannia tower; thns dividing the space into four spans, of which the two center ones are 460 ft. each, the other two being comparatively narrow. The short tubes between the abutments and the short towers were constructed, by means of strong scaffolding and stages, in the places they were to occupy when finished; the long central tubes were built at the water-edge, from whence they were floated off on pontoons to the base of the towers, which had grooves or recesses made to receive them, and then elevated gradually (supports being built under their ends as they ascended) by powerful hydraulic presses to the requisite height, 102 ft. above high-water mark. On the 13th of Oct., 1849, the first long tube, 472 ft. in length (12 ft. being allowed for the rest at both ends), and about 1800 tons in weight, was safely fixed at its proper height above the sea. The other center tube was got up by Dec.; and on the 5th of Mar., 1850, a train swept through, and the bridge was open for traffic. In Aug. the parallel line of tubes was completed, and the up and down trains could now pass over the Menai with as little delay and danger as over any other part of the line. The total length of the bridge is 1841 ft., of the tubes, 1513 feet. The extreme height of the tube at the Britannia tower is 30 ft., diminishing to 22 ft. 9 in. at the abutments, "the difference being made to give a true parabolic curve to the top while the bottom is straight." Inside, the width is 13 ft. 8 in. throughout, and the height 26 ft. at the middle, and 18 ft. 9 in. at the ends. To provide for the expansion and contraction of the metal, the bed-plates in the shore towers and in the abutments, on which the tubes rest, are made to move freely on cast-iron rollers and balls. This precaution, for securing free movement to the tubes, was not unnecessary, as it has been found that between the expansion of summer and contraction of winter there is a difference of fully 12 inches. The total weight of iron used was nearly 12,000 tons, of which the tubes contain 9360 tons of malleable iron, 1015 tons of cast iron, and 175 of permanent railway. In their fabrication 186,000 different pieces of iron, fastened together by more than 2,000,000 rivets, were used; and in the towers, abutments, etc., there is 1,492,151 cubic feet of masonry. The total cost was about £602,000. The whole structure was completed in less than five years. See Tubular Bridge.

BRITANNICÆ INSULÆ, a term used by ancient classic writers previous to Cæsar for the British isles, including Albion (England and Scotland), and Hibernia or Ierne (Ireland), with the smaller isles around them. Aristotle, in the beginning of the 3d c. B.C., knew only of Albion and Ierne. Cæsar, about 54 B.C., was the first to apply the name Britannia to Albion. Ptolemy, in the 2d c. A.D., is the first to apply Little Britain to Ierne or Ireland, and Great Britain to Albion or England and Scotland. Herodotus, in the 5th c. B.C., is the first writer to mention Britain with any sort of definiteness; previous Greek writers speak of Britain only in connection with the Phenician tin trade carried on with the Cassiterides or Tin isles (the Scilly isles and Cornwall), which they often confound with the Azores. The Phenician trade with the British isles began about 1000 B.C., the Phenicians giving the native Britons salt, skins, and bronze vessels in exchange for tin and lead. Ptolemy enumerates 52 different Celtic or Gaelic tribes as inhabiting Britain in his time. See CELTIC NATIONS.

BRITANNICUS, son of the emperor Claudius by Messalina, b. 42 A.D. He was the natural successor to Claudius, but after his mother's execution (when B. was eight years old), Agrippina, the new wife, persuaded Claudius to pass by B. and adopt her son by previous marriage with Lucinus Domitius. This son was the emperor Nero; and soon after his accession, Pallas, one of Agrippina's lovers, who had been banished, threatened a revolt, and roused Nero's fear that B. might displace him; so B. was poisoned and died on his fourteenth birthday.

BRITISH AMERICA. See AMERICA, BRITISH, *ante.*

BRITISH ARMY. In ARMIES, MODERN, a succinct account is given of the relative strength and organization of the chief European armies, with the exception of that of the British empire, reserved for consideration in the present article.

Like other modern armies, the British army originated in the feudal system (q.v.). When regal power, tempered by a parliament, superseded that system, the people, according to their rank in life, were expected to provide themselves with certain kinds of weapons and defensive armor. The justices of the peace were empowered to see to these military duties of the people. When the nation was either actually engaged in war, or apprehensive of invasion, the sovereign issued commissions to experienced officers, authorizing them to draw out and array the fittest men for service in each county, and to march them to the sea-coast, or to any part of the country known to be in most danger. See ARRAYER. It was in the time of Henry VIII. that lord-lieutenants and deputy-lieutenants of counties were first appointed as standing-officers for assembling and mustering the military force. During the earlier years of the Tudors, contracts were made by the king with "captains," who undertook to provide, clothe, and feed so many fighting-men, for a given money-allowance; but the power intrusted to the lord-lieutenants gradually changed this system, in relation at least to home-defense. In the reign of Charles I., the important question arose, whether the king of England did or did not possess the right to maintain a military force without the express consent of parliament? and this question was all the more bitterly discussed when the king billeted his soldiers on the people. After the troubles of the civil wars and the commonwealth, Charles II. found himself compelled to agree, on his restoration, to the abandonment of all the army except a kind of body-guard or household brigade of 5000 men, sanctioned by the parliament. In the 13th year of his reign, he succeeded in obtaining a statute, declaratory that "the sole and supreme power, government, command, and disposition of the militia, and of all forces by sea and land, and of all forts and places of strength, is the undoubted right of his majesty; and both or either of the houses of parliament cannot nor ought to pretend to the same." Both Charles II. and James II. found, however, to their mortification, that this statute did not in effect give them so much real military command as they had wished and intended—because the commons, by holding the purse, virtually held the power.

It was in the time of William and Mary that the real basis for the modern B. A. was laid. The declaration of rights (q.v.) settled, in positive terms, "that the raising and keeping of a standing army in time of peace, without consent of parliament, is contrary to law." The first mutiny act (q.v.) was passed in 1689, to last for six months only; but it has been annually renewed ever since, except in three particular years; and it constitutes the warrant on which the whole military system of England is exercised by the sovereign, with the consent of parliament. Since then, with only three interruptions, the ministers of the crown have annually applied to parliament for permission to raise a military force, and for money to defray the expenses. The sovereign can make war, and can bestow military employments and honors; but the commons, as the representatives of the tax-paying nation, provide a check on the grasping by courtiers of military privileges. The law on army regulation has been revised, and the B. A. made the subject of special legislation in the army discipline bill passed in 1879.

The great distinction between the B. A. and that of almost every other state in Europe, is that the service is *voluntary.* The subjects of the crown engage, by free choice, to serve in the army for a definite number of years. In the rare cases where forced service by ballot is obtained, it is in the militia, not the regular army. See MILITIA. The British soldier has much hard colonial life to bear, and many long voyages to make; he is, moreover, almost entirely shut out from the chance of being a commis-

sioned officer. As a consequence, the ranks are mostly filled from the more necessitous classes of the community—by those who from want of steady habits, or of education, are the least fitted for industrious pursuits; whereas in France and many other foreign countries, the profession of arms is regarded as an honorable one, of which even the private soldier feels proud. Mr. De Fonblanque, comparing the peace establishments of the chief European armies in 1857, found that of England to be the smallest in ratio to population, but the most costly in relation to its strength. The English ratio was 1 in 128; the French, 1 in 95; the Prussian, 1 in 80; the Russian, 1 in 72; the Austrian, 1 in 68. An English private soldier costs the country £52 per annum; French, £36; Prussian, £31; Austrian, £18 10*s.*; Russian, £13 5*s.* The English cost per man is still higher now than it was in 1857, on account of increased attention being paid to the well-being of the soldier.

The B. A., in all its completeness, is supposed to be commanded by the sovereign, assisted by the secretary of state for war in some matters, and by the officer commanding in chief in others. The component elements are the household troops; the infantry of the line; the cavalry of the line; the ordnance corps, comprising artillery and engineers; other bodies of native troops, maintained out of the revenues of India; the militia; the yeomanry cavalry; the reserve; the volunteer artillery and rifles; and sometimes during war, foreign legions. The "peace establishment" of the B. A. varies according to the political aspect of affairs abroad, and to the strength of the economizing principle at home. In 1814, when England was engaged in tremendous contests abroad, the regular army reached 200,000 men, exclusive of fencibles, foreign legions, and militia. In the first few years after the termination of the great war against Napoleon, the reductions in the B. A. involved the compulsory retirement of no less than 10,000 military officers, who thereupon went on half-pay; these, by filling vacancies, transfers, and deaths, have nearly disappeared. The elasticity which permits the enlargement or contraction of the army arises from varying, not so much the number of regiments, as the number of battalions in a regiment, of companies in a battalion, or of men in a company. If we compare the strength of the regular army at various periods between 1820 and 1879, we shall find that the actual number of regiments has varied but little, the difference of strength being made up in the three modes just mentioned. See War Services.

The strength of the B. A. declined from 1815 to 1835, since which last-mentioned year it has increased. These augmentations have been occasioned partly by the contests in China, India, Kaffraria, Persia, the Crimea, Afghanistan, and Zululand, and partly by a sense of insecurity amid the vast armaments of the continent. In comparing the strength of the forces at different periods, much confusion is apt to arise from different modes of interpreting the words "British army." This designation may include the whole of the royal troops in India, whether supported out of imperial or of Indian revenues; it may include the militia, the volunteers, the yeomanry cavalry, the foreign legions—or it may exclude any one or more of these. The "British army," and the "military force of the British empire," are often treated as convertible terms: to the production of much confusion where actual numbers are given. In the following table, relating to the official year 1879–80, it is shown of what component elements the B. A. now consists. The militia and the volunteer corps are not here included.

BRITISH ARMY VOTED FOR 1879–80.

	Home and colonies.	India.		Total British army.
Horse artillery	3,131	2,478	=	5,609
Cavalry, including household cavalry	12,907	4,312	=	17,219
Artillery	19,225	9,667	=	28,892
Engineers	5,198	428	=	5,626
Infantry, including foot guards	76,366	45,768	=	122,134
Service corps	2,990	..	=	2,990
Colonial corps	2,485	..	=	2,485
Army hospital corps	1,745	..	=	1,745
Additional force in consequence of reinforcements to Natal	3,900	..	=	3,900
	127,947	62,653		190,600

Under the column "India," are included only those troops of the royal army which are *lent* to India, and paid for out of Indian revenues; the other military forces in that region are enumerated under East India Army. Of the total 190,600 forming her majesty's forces, 7980 are officers; 16,550 non-commissioned officers, drummers, and trumpeters; and 166,070 rank and file. There are voted for the use of this army, 11,325 horses. The total cost cannot well be estimated per head; because, besides pay and sustenance for the soldiers, there are stores and wages for fortifications and military buildings, military weapons and combustibles, and the various kinds of half-pay and pensions. The total expenditure sanctioned by parliament may, however, conveniently be thrown under four headings, and given in round numbers as follows:

Pay and allowance of combatants.....	£4,944,200
Auxiliary and reserve forces.....	1,258,500
Stores and and works of every kind.....	6,817,200
Pensions, militia, volunteers, etc.....	2,625,800
	£15,645,700

—being the charge for a *peace* establishment, in which to admit of expansion for actual war, the upper ranks (which cannot be summarily created) are disproportionately large. For the sum taken in aid of the army estimates to meet the expenses for raising and training the recruits, and for the non-effective services of the European army serving in India, a separate estimate was presented (1879–80), amounting to £1,100,000.

All the component elements of the army, in *personnel* and *matériel*, and the organi zation and duties of the troops, will be found noticed under their proper headings. The total military strength of the United Kingdom—including all the various kinds of force, also India and the colonies—comprised the following in 1885:

Regulars (including India and the colonies).....	191,705
Army reserve, 1st class.....	42,500
" " 2d "	7,750
Militia (including permanent staff and militia reserve).....	141,982
Yeomanry cavalry.....	14,404
Volunteers (including staff).....	249,412
	647,753

BRITISH ASSOCIATION, an association whose object is, by bringing together men eminent in all the several departments of science, to assist the progress of discovery, and to extend over the whole country the latest results of scientific research. A prevailing impression that England had fallen behind other countries, both as to the general estimation in which scientific men were held, and the prosecution of science itself, led to its formation. It was thought that an imposing union of men of science with the nobility, gentry, and clergy might tend to revive the philosophic spirit of the country. Such meetings had already taken place in Germany, and probably suggested the idea of this institution. Many leading men of the age took part in its formation, but the honor of being its founder must be ascribed to sir David Brewster. By his exertions the first meeting of those who were favorable to the design was held at York in the year 1831. The archbishop of York, the mayor and council of the city, entered warmly into the project. At this meeting the constitution of the society was determined, the several sections had their provinces assigned to them, and subjects were proposed on which reports were to be drawn up and read at the ensuing meeting. This took place at Oxford in 1832. The university had cordially welcomed the new association, the papers which were read gave it at once the high character it has since sustained, and from this date it may be said to have been in complete and successful operation. An enumeration of the several sections of the society, each of which has its own committee and president, will show the wide range of topics it embraces: Section A., mathematical and physical science; B., chemistry; C., geology; D., zoology and botany, including physiology; E., geography and ethnology; F., economic science and statistics; G., mechanical science.

At the close of each meeting, it is determined at what town in the United Kingdom the next shall be held, and a president of the whole association is appointed, who delivers an inaugural address, in which he is expected to present a general survey of the latest advances of science. The rules and by-laws of the society it is not necessary here to particularize; but it should be mentioned that the subscriptions of a continually increasing membership have placed at its disposal a large fund, which has been expended in the prosecution of science. In many cases, as in long astronomical calculations, or extensive meteorological observations, the labor of subordinates is required, and a certain apparatus, and it is in defraying such expenses that the funds of the B. A. are very wisely employed. The A. met at Montreal, Canada, 1884.

Besides the immediate ends sought to be obtained by such an association, its utility will be evident if we reflect on the intimate connection that exists between the several branches of science, and the impossibility there is that any one mind can be thoroughly conversant with them all. He who now hopes to make discoveries in science must limit himself to a few chosen studies; and yet such is the interlacing of all the several branches of inquiry, that he must often find it indispensable to know the last results of each. The botanist or the physiologist must consult the accomplished chemist; the chemist must call in the aid of those who have specifically studied the action of heat, light, and electricity; the geologist needs them all, and is in turn consulted by all. Thus, a certain brotherhood of science is formed, in which each has his specialty, and yet each leans upon his brother.

In ancient times it was otherwise. The facts on which a philosopher speculated were those which lay open to the eyes of all. A Thales could see the rain fall and plants grow, and forthwith pronounced that the vital energy of all things was to be found in

water. He could exercise his imagination in perfect independence of the labor of all other men. The philosopher of modern times cannot move a step without a careful consideration of the theories of his predecessors and contemporaries; he has to take notice of the innumerable facts brought to light by various observers, aided by those artificial arrangements which convert observation into experiment.

Two classes of men, of the most opposite character, are greatly aided by an association such as this. The humble and plodding workmen are taught where their patient industry will most avail; they are cautioned against re-discoveries; they are told where their love of collecting or experimentalizing may be best applied. And that other class of men, who love to generalize, who ever seek to embrace all the multifarious facts of science under a few great laws—these are provided with the very last intelligence from every department of inquiry, and may forthwith proceed to weave it into their own comprehensive scheme. Nor are we to overlook the benefit which the whole community derives from the rapid dissemination of the latest results or speculations of philosophy. Not only do our idle and fashionable, as well as our manufacturing towns and our universities, welcome the meetings of the B. A., but from this *Parliament of Science* the utterance of scientific opinion goes forth over the whole kingdom through the agency of the press. Within three days after one of its meetings, there is not a workshop or a tea-table in the country that has not derived from it a new topic of conversation. This kindling of an interest in science, through the whole population, we regard as amongst the greatest advantages of the British association.

BRITISH BURMAH. See Burmah, British, *ante.*

BRITISH COLUMBIA. See Columbia, British, *ante.*

BRITISH EMPIRE. See Great Britain and Ireland.

BRITISH GUM, Dextrine, or Lei'ocome, is a substance extensively employed by calico-printers and others for the thickening of colors, instead of the much more expensive gum arabic. It is prepared from potato-starch (q.v.) or sago-starch by passing the grains through iron cylinders at a temperature about 500° F. It differs from starch in giving no blue color with tincture of iodine, and in being readily soluble in water, and thus yielding a thick liquid resembling in consistence mucilage (strong solution of ordinary gum). B. G. is the material which is produced by baking in the crusts of loaf-bread (q.v.), and which communicates to them their very agreeable taste.

BRITISH MUSEUM. The British Museum, an important national institution in London, originated in a bequest of sir Hans Sloane, who, during a long lifetime, gathered an extensive and, at the time, unequaled collection of objects of natural history and works of art, besides a considerable library of books and manuscripts. These, in terms of his will, were offered, in 1753, to the government, on condition that £20,000 should be paid to his family, the first cost of the whole having amounted to more than £50,000. The offer was accepted; the necessary funds were raised by a lottery! and the collection, along with the Harleian and Cottonian libraries, were arranged in Montague house, which had been purchased for £10,250. The new institution, thenceforth called the British Museum, was opened in 1759. From time to time, purchases and donations succeeded each other rapidly. Montague house sufficed for the reception of all these acquisitions, till the Egyptian antiquities arrived in 1801. The purchase of the Townley marbles, in 1805, necessitated the erection of a gallery for their reception. This, however, did not meet the increasing demand for space. The old house was condemned, and plans were prepared by sir R. Smirke for new buildings; but none were undertaken till 1823, when the eastern wing of the present building was erected for the reception of the library of George III., which had been presented to the museum by George IV. The subsequent progress of the works was very slow. The building was completed in 1847. It is a hollow square, whose sides are opposite to the four points of the compass. Throughout the exterior of the building, the Grecian Ionic is the order of architecture adopted. The principal front is towards the s., facing Great Russel street, and presents an imposing columnar façade, 370 ft. in length. The great entrance-portico, in the center, is composed of a double range of columns, 8 in each range. The columns are 5 ft. in diameter at their base, and 45 ft. in height. The tympanum of the portico is ornamented with an allegorical sculpture by Westmacott, typical of the progress of civilization. On either side of the museum, there is a semi-detached house, containing the residences of the chief officers of the establishment. These give an additional length of 200 ft., making the whole length of the structure 570 feet. The interior of the building is admirably adapted to the purposes for which it is devoted. Some of the galleries, from their size and dimensions, have a very imposing appearance, as the king's library, the bird gallery, etc. The grand entrance-hall is a noble and lofty apartment, built in the massive Doric style: it contains a statue of sir Joseph Banks by Chantrey, and an ideal representation of Shakespeare by Roubilliac.

Scarcely had Smirke's plans been carried out, when demands were made from several of the departments for more accommodation. Additions have accordingly been made, rooms having been provided for the print department, and several new galleries for the recent acquisitions of antiquities; but the most important addition is the mag-

nificent reading-room which has been erected in the internal quadrangle. In no department of the museum was additional accommodation more needed than in the library. The number of readers had increased beyond the means of accommodation, and so short of space were they for books, that the estimates for purchases were restricted to only the half of the sum which the trustees considered desirable, for the sole reason that the library would be inadequate for the reception of extensive additions. After considerable delay, and the consideration and rejection of several plans, nothing was done till Mr. Panizzi, at that time keeper of the printed book department, suggested a plan which promised to meet the important requirements of speedy erection and economy in cost. The plan was at length adopted, and the result is a building than which none are better, few perhaps so thoroughly adapted to the purposes for which it is intended. Parliament voted the first grant for it in 1854. It was opened in 1857. The total cost was about £150,000, which includes the fittings and furniture, and the necessary shelves for immediate use. The building was erected in the interior quadrangle, which it completely occupies, with the exception of an interval of about 28 ft. all round, necessary for lighting and ventilating the surrounding building. The reading-room is circular. It is constructed principally of iron, with brick arches between the main ribs. The dome is 106 ft. in height, and its diameter 140 ft., being second only to the pantheon of Rome, and that but by 2 feet. The use of iron has economized the space to an extraordinary degree, for while the piers which support the pantheon fill 7477 ft., those on which the reading-room rests occupy only 200 feet. Equally remarkable has been the saving of space in the fitting up of the library. The shelves are formed of galvanized iron plates, edged with wainscot, and covered with leather, and are supported on malleable iron standards. In all the cases except against the external walls, the bookcases are double, a lattice of ironwork being fixed for the longitudinal separation of the books. Thus, throughout the whole interior of the new building, walls are dispensed with, the divisions being in all cases formed of the double ranges of books. The building contains 3 m. lineal of bookcases 8 ft. high. Assuming them all to be spaced for the average octavo book size, the entire ranges form 25 m. of book-shelves, and would accommodate 1,000,000 such volumes. In addition to this, the dome-room, which is the reading-room, has accommodation for 60,000 volumes. This magnificent room contains ample and comfortable accommodation for 300 readers. Each person has a space of 4 ft. 3 in. long. He is screened from the opposite occupant by a longitudinal division, which is fitted with a hinged desk, graduated on sloping racks, and a folding-shelf for spare books. In a recess between the two are placed an inkstand and penholders, thus leaving the table unincumbered. By an ingenious contrivance, one part of the iron framework is made to distribute fresh air in the summer and heated air in the winter. The vitiated air is conveyed through apertures in the soffits of the window, into one of two separate spherical and concentric chambers which extend over the whole surface of the roof, and escapes through outlets around the lantern. The other chamber, between the external covering of copper and the brick vaulting, has for its object the equalization of temperature, during extremes of heat and cold out of doors. Every modern improvement, in short, has been applied, when it could be serviceable, for the comfort or convenience of the readers. Much praise is due to the architect and builder, but a larger share is owing to the late sir A. Panizzi, who not only supplied the original design, but daily, almost hourly, superintended the progress of the work, continually suggesting little improvements, and in the end producing a room which is admired by all especially those who daily use it.

This building, while supplying amply the demands of the printed book department, did nothing, to meet the requirements of the other departments. Various schemes have been suggested; the best, and perhaps in the end the cheapest, of securing the ground immediately around the museum, has been given up, and the trustees resolved to erect a building to be devoted entirely to natural history—that is to say, to the departments of botany, zoology, geology, and mineralogy—on the site occupied by the international exhibition of 1862. Parliament voted in the year 1873, £80,000 for this purpose, and a beginning was made by the contractor. The whole cost of the new building very nearly reached the sum of £400,000. This elegant new terra-cotta building, situated in the Cromwell road, near South Kensington museum, was designed by Mr. Alfred Waterhouse.

Contents.—At first, the contents of the museum were arranged under three departments—printed books, manuscripts, and objects of natural history. Under the last head were included the antiquities, works of art, etc., comprised in the Sloane collection, their number being too scanty to entitle them to constitute a separate department. The progress of the museum has caused a more precise division of its contents. From time to time, the number of the departments has been increased, so that, instead of three, there are now twelve—viz.: printed books, maps, manuscripts, prints and drawings, oriental antiquities, Greek and Roman antiquities, coins and medals, and British and mediæval antiquities and ethnography, zoology, botany, geology, and mineralogy. In noticing the contents of the museum, we shall refer to them in this order. We can but allude here to the most important portions of the collection, and must refer for more particular information to works specially devoted to this subject; such as the various handbooks and catalogues prepared by the officers of the museum.

Printed Books.—This is the largest department in the museum. It occupies the whole of the ground floor on the n. and e. sides, the new building erected in the quadrangle, and a considerable portion of the basement of the museum. The keeper of the department has the help of 3 assistant-keepers and 43 assistants. There are in addition 54 attendants.

The original bequest of sir Hans Sloane consisted of 50,000 volumes. When these were placed in Montague house, a small collection of 2000 volumes, bequeathed to the nation by maj. Edwards in 1738, was added to them. In 1757, George II. presented the library of printed books which had been collected by the kings of England since Henry VII., and which included the libraries of Cranmer and Casaubon. He also annexed the important privilege, which the royal library acquired in the reign of queen Anne, of being supplied with a copy of every publication entered at Stationers' hall. By this means the library has been supplied with the current British literature without expense or trouble, and the trustees have been able to devote the funds of the museum to the purchase of the earlier literature of the country and foreign publications. Among subsequent additions to the library may be mentioned the voluminous collection of pamphlets, etc., relating to the civil wars of England between 1640 and 1660, presented by George III.; the musical libraries of sir J. Hawkins and Dr. C. Burney; Garrick's collection of old English plays; Dr. Bentley's collection of the classics, annotated by his own hand; the law library of F. Hargrave; sir J. Banks's valuable and extensive collection on natural history; and a large mass of tracts and pamphlets relating to the French revolution, purchased from J. Wilson Croker, and of very great value. The most important addition was made in 1823, when George IV. presented the splendid library that had been collected by his father during his long reign, at an expense of little less than £200,000. This library, which, from the terms of the gift, cannot be mixed with the general collection, occupies a large and handsome hall, extending along the whole of the ground floor of the eastern side of the museum. It is undoubtedly the finest and most complete library ever formed by a single individual. "It contains," says sir H. Ellis, "selections of the rarest kind, more especially works of the first ages of printing; it is rich in the early editions of the classics; in books from the press of Caxton; in the history of the states of Europe; in the languages of the respective countries; in the transactions of academies; and in a grand geographical collection." The magnificent library of the right hon. Thomas Grenville, in importance second only to the king's library, was bequeathed to the museum in 1846. It consists of 20,240 volumes, which cost upwards of £54,000. In the same year was obtained also the extensive collection of Chinese works, amounting to 11,509 volumes, which belonged to Robert Morrison. By purchases, bequests, and donations, the library has become one of the first in the world, containing now over 1,300,000 printed volumes. See LIBRARIES. But even this figure, large though it is, does not represent the immense collection of separate and distinct articles in tracts, pamphlets, and manuscripts. The British museum library is (with the exception, perhaps, of the national library of Paris) the largest collection of printed literature in the world. Since the opening of the new reading-room, and the consequent acquisition of the book accommodation, the want of which long hindered the proper increase of the library, the rate of increase has been enormous. During the year 1880, there were added 27,543 volumes, including music and volumes of newspapers, of which 3379 were presented, 15,361 purchased, 8857 acquired by home copyright, and 941 by international copyright. The number of parts of volumes was 39,873. In addition, the library had accumulated numerous broadsides, and miscellaneous articles variously obtained. The numbers of the pieces of music alone added were 5911 complete works, besides 1790 parts and numbers of works in progress. The total number of articles received during the year amounted to 76,774. In 1874, 37,000 volumes were received; '80, 2000 sets newspapers.

A catalogue of the printed books, in 7 octavo volumes, was published in 1813–19. So great have been the additions to the collection since the publication of that catalogue, that the interleaved copy of it, in which the new entries were made, had expanded in 1846 into 82 folio volumes. This is now superseded by one general MS. catalogue, contained in upwards of 1600 folio volumes. There are separate catalogues of the Grenville library, in 6 volumes; of music, in 126 volumes; of newspapers, in 4 volumes; of the pamphlets in the king's library, in 9 volumes; and of the pamphlets published during the civil war and commonwealth, called the "Thomason collection," in 12 volumes, all folio. These various catalogues are placed in the central circular stands in the reading-room, for consultation by readers. Here also are copies of the catalogue of the books of reference, arranged around the wall of the room, to which the readers have free access without the intervention of an official. These books, forming a library of 20,000 volumes, have been carefully selected to represent all the different branches of knowledge. The facility of consultation has been increased by the employment of different colors in the binding, corresponding to the colors of a hand catalogue scattered throughout the room. Thus theological works are bound in blue, historical in red, philosophical in green, and so on.

The right of access to the library is easily obtained. Any person desiring it, is "to apply in writing, addressed 'To the principal librarian of the British museum,' and not otherwise, specifying his description and place of abode, and accompanying his letter with a written recommendation, satisfactory to an officer of the museum." Formerly,

the right of admission was granted only for six months at a time, and had then to be renewed. Under the new regulations, the ticket, once granted, does not require renewal; it can, of course, be withdrawn, and is not granted to persons under 21 years of age. When the reader has become well known to the officials, he is not even asked to show his ticket.

Maps.—The maps, charts, plans, and topographical drawings were separated from the library, to form a distinct department, in 1867. There are over 50,000 published and 20,000 manuscript maps in the museum. Many of the latter have thrown much light on the history of early geographical discovery.

Manuscripts.—The manuscripts are contained in several rooms in the s.e. angle of the building. The work of the department is carried on by a keeper, assistant-keeper, a keeper of oriental manuscripts, and nine assistants. The manuscripts are for the most part bound in volumes, and placed in cases around the rooms. The collection consists of: 1. The Sloanean manuscripts, relating chiefly to medical and natural history subjects. 2. The Cottonian manuscripts, rich in documents referring to the history of Britain, including two of the originals of *Magna Charta,* in registers of English monasteries, and in original letters of royal and illustrious personages. This collection contains the *Durham Book*—a copy of the Latin Gospels, with an interlineary Saxon gloss, finished in the year 720. 3. The Harleian manuscripts, a collection rich in illuminated manuscripts, in ancient, civil, and ecclesiastical records, in manuscripts of the classics, among which is one of the earliest known copies of the *Odyssey,* and in early English poetry. 4. The manuscripts of the ancient royal library. These were collected by our kings, from Richard II. to George II.; many of them were obtained from the monasteries, on their destruction. Amongst the most valuable treasures here are the *Codex Alexandrinus,* a manuscript of the Bible written in uncial Greek, before the close of the 5th c.; and the *Basilicon Doron* of James I., in his own handwriting. 5. The Lansdowne manuscripts. This collection comprises the Burghley and Cæsar papers, the manuscripts of bishop Kennett, and numerous valuable historical documents and state papers. 6. The Hargrave manuscripts, almost exclusively connected with law. 7. The Burney manuscripts, containing a large collection of the Greek and Latin classics. Among them is a copy of the *Iliad,* answering that of the *Odyssey* in the Harleian collection. 8. The Howard-Arundel manuscripts, obtained from the royal society. This collection is singularly rich in materials for the history of our own country and language. 9. The Oriental manuscripts, a collection composed of several purchases and bequests. It includes the manuscripts acquired by Mr. Rich while consul at Bagdad, and consists of numerous Syriac, Arabic, Ethiopic, and other oriental codices. A large series of Ethiopic manuscripts was obtained at Magdala, on the occasion of the Abyssinian war. 10. Additional manuscripts. This collection consists of innumerable bequests, donations, and purchases, which from the establishment of the museum have been and are still being acquired. Among recent additions may be specified a charter of William the Conqueror; the original mortgage-deed of a house in Blackfriars, dated 11th Mar., 1612, and signed by William Shakespeare; the holograph manuscript of Scott's *Kenilworth,* and of many of Burns's poems, including the *Cotter's Saturday Night,* and the songs published in Johnson's *Scots Musical Museum;* an extensive series of papal bulls; several *Books of Hours,* including the famous *Bedford Missal;* and a large collection of original letters and papers relating to the affairs of Scotland during the 16th and 17th centuries. Catalogues of the complete collections have at different times been published. The additions to the ever-increasing oriental and additional collections are at intervals published in supplements to each of the original catalogues. Copies of all these, with manuscript lists of the annual additions, are placed in the reading-room for consultation.

Supplementary catalogues were printed up till 1853; since then the additions have been kept up in manuscript catalogues. A general class catalogue, embracing all the collections, has been commenced, and the printing of it has begun. The first part is a catalogue of ancient and illuminated manuscripts, illustrated with photographic *fac-similes,* of which several volumes are published.

The right of using the reading-room includes the privilege of consulting the manuscripts. During 1880, the number of deliveries of manuscripts to readers in the reading-room amounted to 29,239. To artists and others in the rooms of the department, 6000 deliveries were made. These numbers do not include the volumes exhibited to visitors on private days.

Prints and Drawings.—The collections of this department, managed by a keeper and two assistants, are kept in rooms in the n.w. angle of the building. They consist of prints and drawings bequeathed to the museum, in 1799, by the Rev. C. M. Cracherode; of those bequeathed in 1824 by Mr. Payne Knight; and of numerous smaller bequests and donations. No purchases were made for this department until about 1840, when a sum was first included in the estimates for this purpose. Since that time, the prints and drawings have been increasing at a rate equal to any of the other departments of the museum. The collection is arranged in *schools.* 1. The Italian school, containing original drawings by Leonardo da Vinci, Raphael, Correggio, Tintoretto, Paul Veronese, Michael Angelo, Guido Reni, Salvator Rosa, and others. 2. The German school, containing drawings by Albert Dürer, Hans Holbein, Dietrich, Hollar, and others; and

engravings by Lucas Cranach, Martin Schon, Gauer, and others. 3. The Dutch school, containing several superb originals of Rubens, an extensive and nearly complete set of the works of Rembrandt, with many drawings by A. Cuyp, Teniers, Van Dyck, etc.; and engravings and etchings by Berghem, Lucas van Leyden, Rembrandt, Ostade, etc. 4. The French school, with drawings by Watteau, Claude Lorraine, etc., and etchings and engravings by Bourdon, Boisseaux, Le Prince, etc. 5. The Spanish school, represented by some drawings of Murillo, and others of less note. And, 6. The English school, containing drawings by R. Wilson, Wilkie, Stothard, Callcott, Gibson, etc.; a splendid collection of Hogarth's prints, and specimens of the works of Barlow, Gaywood, Raimbach, Finden, Worlidge, Geikie, etc.

This department contains also an extensive and very valuable collection of works in niello; a beautiful silver cup, designed and carved by Benvenuto Cellini, and a wonderful stone-carving in alto-relievo by Albert Dürer, representing the birth of St. John

Oriental Antiquities.—Within the last ten years the objects in the museum, included under the name antiquities, have been divided into four departments. The first of them includes the Egyptian and Assyrian antiquities. The Egyptian monuments date from a period as remote as 2000 years before the Christian era, and come down to the Mohammedan invasion of Egypt, 640 A.D. The collection has been obtained chiefly from these sources: the antiquities which fell into the hands of the British army at the capitulation of Alexandria, presented by George III.; presents from gen. Vyse, the duke of Northumberland, the marquis of Northampton, sir Gardner Wilkinson, and others; and acquisitions from the earl of Belmore, Mr. Salt, and M. Anastastie. The sculptures are formed of granite and basalt; they represent human and allegorical figures, sometimes of colossal size. There are several beautifully sculptured sarcophagi. Most of the monuments are inscribed with hieroglyphics (q.v.). The key to this dead and forgotten language was furnished by the celebrated Rosetta Stone (q.v.), which is placed in the center of the gallery. The smaller Egyptian remains are exhibited in a gallery on the upper floor; they consist of objects relating to religion, as representations of divinities and sacred animals, in wood, metal, stone, and porcelain; of objects relating to civil and domestic life, as dress, personal ornaments, household furniture, artistic and writing implements, armor, and weapons of war, etc.; and of objects relating to death and burial, as mummies and coffins, with the scarabæi, amulets, and other ornaments found with them. A collection of papyri is exhibited on the n.w. staircase, containing extracts from the ritual of the dead.

The Assyrian antiquities are contained in a suite of rooms recently erected on the outside of the Egyptian gallery, and in a spacious room on the basement. The collection consists of sculptures excavated at Nimrud, Khorsabad, and Koyunjik by Layard, in 1847–50, and more recently by Rassam and Loftus, under the direction of sir H. C. Rawlinson. The Nimrud sculptures are the oldest, belonging to a period ranging from 930 B.C. to 747 B.C. Those obtained from Khorsabad seem to have been executed under a monarch who reigned about 747–721 B.C., while the collection from Koyunjik belong to the time of Sardanapalus, apparently 721 B.C. and 625 B.C. The monuments consist chiefly of slabs of gypsum, alabaster, and limestone sculptured in low relief, the subjects being the exploits of the king whose palace walls they ornamented. Many of the sculptures are covered with cuneiform (q.v.) writing, which, by the labors of Rawlinson, Hincks, and Smith, has been deciphered, giving us a history of this remarkable people, and corroborating the narrative of the sacred Scriptures whenever they refer to the same event. See ASSYRIA. Besides the series of sculptures, the Assyrian collection includes a variety of smaller but highly curious and instructive objects, discovered at Nimrud and Koyunjik.

Greek and Roman Antiquities.—This collection occupies four apartments, which run parallel to the Egyptian gallery. The Lycian gallery contains a series of architectural and sculptural remains from ancient cities in Lycia, obtained by sir C. Fellows in 1842–46. In the next gallery are the remains of the famous mausoleum (q.v.) at Halicarnassus, erected in honor of Mausolus by his widow Artemisia. These remains were discovered by C. T. Newton, esq., in 1857–59. In the same room are some remains of the temple of Athene Polias at Priene, including the stone on which its dedication by Alexander the great is inscribed. The Elgin gallery contains the sculptures from Athens and Attica, the greater portion of which were obtained by the earl of Elgin, and purchased from him by parliament in 1816 for £35,000. The most important series in the gallery is the decorations of the parthenon (q.v.), which, notwithstanding their dilapidated condition, form the most valuable monument of Greek art which has descended to modern times. The gallery contains also sculptures and casts from the temple of Wingless Victory, the temple of Theseus, and the erechtheum, at Athens. In an extension recently made to this gallery, are a colossal lion from Cnidus, and a drum of a sculptured column, and other remains, from the temple of Diana at Ephesus. The Helenic gallery contains a number of antiquities brought from Greece and its colonies at different times. The most important are 23 slabs of a frieze sculptured in mezzo-rilievo, which, from the locality where they were found, are called the "Phigalian marbles."

The gallery on the s. side of the building is occupied with the Roman and Græco-Roman sculptures. The bulk of the collection was formed by Charles Townley, esq., and purchased in 1805 for £20,000. Subsequent additions have been made by the bequest

of the collection of R. P. Knight, esq., in 1824, and by various purchases and donations. The collection contains an interesting series of Roman portrait sculptures, and a very extensive mythological series, amongst which are some of universal fame—the Venus, Clytie, the Discobolus, and many others. A room on the basement is appropriated to mosaics and miscellaneous monuments, such as representations of animals, architectural and decorative fragments, and sacred and domestic implements. A fine collection from southern Italy, exhibiting specimens of the arts of the Etruscans, Greeks, and Romans, was bequeathed to the museum by sir William Temple in 1856.

The collections of smaller remains are placed in a suite of rooms on the upper floor. They consist of—1. An extensive series of vases, commonly though not correctly known as Etruscan, formed from the collections of sir W. Hamilton and Mr. Burgon, from purchases at the sales of the prince of Canino, M. Durand, and others; and from excavations in Sicily, Rhodes, and on the sites of Greek colonies in Cyrene and elsewhere. 2. A miscellaneous collection of terra-cottas, mural paintings, and other objects. 3. Bronzes of Greek, Etruscan, and Roman workmanship, consisting of sculptures, and various domestic and other articles, as candelabra, lamps, vases, horse-trappings, armor, etc. 4. The collection of engraved gems and gold ornaments now, since the addition of the Blacas and Castellani collections, perhaps the richest in the world.

Coins and Medals.—The very large collection of these objects is arranged in chronological order under five great divisions, viz., Greek, Roman, Mediæval and Modern, English, and Oriental. The department is under the care of a keeper, assistant-keeper, and four assistants.

British and Mediæval Antiquities and Ethnography.—The British collection is arranged in chronological order. The oldest series contains the antiquities of the stone and bronze periods, consisting of celts, daggers, swords, shields, and early pottery. The British-Roman antiquities comprise specimens of earthenware, lamps, and miscellaneous articles. A small collection of sepulchral urns, weapons, and personal ornaments represents the Anglo-Saxon period. The antiquities found in London, and belonging to the late C. R. Smith, have been recently added to this collection. The ethnographical collection contains antiquities, as well as objects of modern use, belonging to all nations not of European race.

In 1855, the extensive collections of antiquities and ethnography, belonging to Henry Christy, became the property of the museum, having been bequeathed by their proprietor. From the want of space, they are at present accommodated in a house rented for the purpose in Victoria street, Westminster. Felix Slade bequeathed his valuable collection of glass to the museum, and it is now arrayed so as to show the different phases through which the art of glass-blowing has passed, as well as the history of glass in all its branches.

Natural History.—In 1856 the trustees united the natural history departments under prof. Owen, who was then appointed superintendent of natural history. The new building recently erected at Kensington is intended to accommodate this section of the present museum.

Zoological Department.—To give an idea of the contents of this and the other natural history departments, would be to write an epitome of the various sciences they illustrate. This department contains a collection of animals arranged in systematic order in the galleries, comprising stuffed mammals, birds, reptiles, and fishes, and the hard portions of radiate, molluscan, and articulate animals. A room is specially devoted to the fauna of Britain. In rooms on the ground and basement floors are arranged the collections of insects, of osteology, and of specimens preserved in spirits. An idea of the extent of the collection may be formed from the fact that 142 separate publications, illustrative of the contents of the department, in the shape of catalogues, lists, etc., have been issued under the superintendence of the present indefatigable keeper, Dr. Gray. During the year 1874, there were added to this collection, 7524 specimens of animals, of which 2964 were vertebrata, 2886 mollusca and radiata, and 1674 annulosa. In 1873, the unique and extensive collection of birds formed in the eastern archipelago by Wallace, was acquired by purchase. '80, 24,283 specimens of animals were added.

Botanical Department.—The herbarium of sir H. Sloane, the nucleus of this collection, consisted of about 8000 species, bound in 262 volumes. In 1820, the magnificent herbarium of sir Joseph Banks was bequeathed to the museum, and under the superintendence of the late Robert Brown, was transferred to two rooms prepared for it in the s.e. angle of the building. The collection has since been rapidly increasing: during the year 1872, 12,030 species of plants were added; and in the year 1873, the late William Wilson's herbarium of British and foreign mosses was acquired by purchase. The collection contains an extraordinary number of typical specimens—the identical plants from which the original descriptions were taken by Linnæus, Aublet, Jacquin, Brown, Bentham, Bennett, and others. The exhibition rooms contain a series of specimens illustrating the most striking characteristics of the great divisions of the vegetable kingdom, arranged in order; and a series of fossil plants, the value of which is increased by the transparent sections showing their structure, which are placed beside them.

Geological Department.—This collection occupies the wall-cases of the principal gallery on the n. side of the museum. It contains an extensive series of the fossil remains of plants and animals from the various fossiliferous strata; it is especially rich in the

fossils of the secondary formations. Amongst its more valuable contents may be mentioned the collections of Dr. Mantell, the tertiary fossils collected by Dr. Falconer in India, and the remarkable fossil birds from New Zealand.

Mineralogical Department.—The minerals are contained in the table-cases in the geological gallery. They are arranged according to a chemical classification. Many valuable and unique specimens exist in the collection, which is rapidly increasing. In the year 1872, the number of specimens added was 1499 ; '80, 324.

The expenses of the museum are paid by grants of public money. According to the estimates, £110,949 were required during 1879–80 ; £136,432 during 1881–82.

Admission to the museum was at first obtained by printed tickets, which were delivered by the porter to persons making a written application. There could be no more than 45 visitors, at the utmost, per day, under the regulations then in force. Now, all who present themselves are freely admitted; and every week-day the museum is visited by large numbers: as many as 43,000 holiday-folk have passed through the building in one day.

BRITISH NAVY. Under NAVIES, MODERN, will be found a brief description of the chief navies belonging to the continent of Europe, and to the United States of America. The British navy is separately treated in this place.

While the Romans occupied Britain, they were obliged to maintain a fleet of war-vessels on the coasts, to protect it from the ravages of the Saxons, who were the pirates and buccaneers of those times. When the Romans had departed, and the Saxons became dominant, the coasts wese infested by another naval power—the Scandinavian vikings. It was Alfred the great who first established what may be called a navy in this island, consisting of efficient vessels well manned, for protection, and not aggression. Ethelred made the building of a ship a condition for holding a certain acreage of land. William the conqueror strengthened the navy by the institution of the Cinque ports (q.v.). During the first three centuries after the conquest, we read of British fleets of 240,400, and even 730 sail—a proof that the vessels must have been very small even if there were no exaggeration of numbers. Until 1485, the fleets were collected just as wanted; but in this year, Henry VII. conceived the idea of a *permanent* navy, to be ready at all times. He built the largest ship of the age, the *Great Harry*. Henry VIII. pursued the course established by his father, and still further strengthened the navy by instituting the admiralty, the navy-office, the Trinity house, and the dockyards at Woolwich, Portsmouth, and Deptford. The *Henri Grace de Dieu*, the largest ship built by him, was of 1000 tons burden; but most of the vessels were high, unwieldy, and narrow, with the guns nearly down to the water's edge. The ships of the navy presented an aggregate tonnage of 12,000 tons at the period of Henry's death. Elizabeth made a large increase in the navy; but they were not all royal ships which were sent to struggle against the Spanish Armada. James I. made many improvements in ship-building, by encouraging a distinguished naval architect, Phineas Pett. Charles I., who built the *Sovereign of the Seas*, of 100 guns, was the first to group the royal ships into rates and classes. Cromwell brought up the navy to the strength of 154 sail, including a large number of two-deckers. Charles II. allowed it to fall into decay for a time; but his brother, the duke of York, who afterwards became James II., not only restored it, but brought it to a higher state of efficiency and strength than ever. When William of Orange became king of England, he found a navy carrying 7000 guns and 42,000 seamen; he built many additional ships, some with as many as 80 guns, and established Plymouth dockyard. Queen Anne succeeded to the possession of a fine navy; which at her death had increased to 198 ships, mounting 10,600 guns, with a tonnage of 157,000 tons. George I. attended to the navy chiefly in repairing the ships after a period of war, and in supplying a new armament. George II. greatly added to the number of ships, established a naval uniform, and increased the renown of the British navy during the war against Spain.

The long and eventful reign of George III. was especially distinguished by the achievements of the navy. When he came to the crown in 1760, he found himself in possession of 127 ships of above 50 guns, and 198 of 50 guns and under, manned by 70,000 seamen. These numbers, by building and by capture, were increased to 174 and 203 respectively, by the end of the American war. Throughout the European struggle, from 1793 to 1815, the B. N. exhibited a spectacle for vastness and achievements which had never before been equaled in any country. In the first nine years of this period, between 1793 and 1802, England lost by war 5 ships of the line and 46 smaller vessels; but she captured from the French, Dutch, Spaniards, and Danes, in various battles, 74 ships of the line and 519 smaller vessels; or rather, four fifths of this number were captured, and one fifth destroyed. Besides these, more than 800 privateers were taken and destroyed by the English. Of the total number of captures, 144 ships of war were at once converted into British ships, and added to our navy. When war recommenced in 1803, England had 189 ships of the line, and 781 smaller ships of war; during the next seven years, the seamen varied from 100,000 to 120,000, and in 1810 the number was raised to 140,000. At all times, many of the ships of the royal navy are unemployed or out of commission; but it frequently happened during that great war, that England had 450 liners, frigates, and sloops, besides smaller armed vessels, employed simultaneously. The conquered vessels added to the navy between 1803 and 1815 were upwards of 100 in number

After the termination of the great European struggle, a large number of ships of war were put "in ordinary," or out of commission, and their officers placed on half-pay. In 1820, the vessels in commission, in ordinary, and building, comprised 127 ships of the line, 311 frigates and sloops, and 27 smaller vessels; but in this total of 465, there were only 113 in commission. In the 19 years that next followed, almost wholly years of peace, the total number of ships of the line, frigates, and sloops, decreased; the gun-brigs, schooners, and cutters increased in number; while the first germs of a new element, a *steam navy*, made their appearance.

The year 1839 must be viewed as a turning-point in the history of the British navy. Twenty-four years of peace had thrown the memory of warlike achievements into the background; and the house of commons had insisted on the lessening of those estimates which provide for armies and navies. It was now found, however, that both Russia and France had accumulated formidable navies. From that year to the present, the B. N., in common with the navies of other powers, has been undergoing a series of "reconstructions." First, ships of larger size, and carrying heavier guns, were built. These ships were of immense power in the days of wooden broadsides, but are now useless for purposes of war. The next stage, from about 1853 to 1859, was the conversion of our force from a sailing to a steam navy. This became the era of great steam frigates of about 5000 tons, and of heavy armaments in a few great guns, of which the *Mersey*, 36 guns, may be taken as a leading specimen. With the introduction of rifled guns, of force hitherto undreamt of, came the necessity for armor-plated sides. The fighting part of the navy (i.e., the line of battle) changed once more after 1860 to low-sided vessels, clad in thousands of tons of iron plates. The *Warrior* was the first ship so built in England, and she was followed by a whole squadron similarly protected. Guns, however, went on increasing in offensive power; and whereas 5-inch plates were at first thought sufficient, now 10-in., 12-in., 14-in., and even 22-in. plates are necessary to exclude shot. Such a vast weight of armor all over a ship would sink any vessel of moderate dimensions. The principle of turret-ships is therefore becoming predominant, in which the greater part of the vessel, clad in comparatively light armor, is under water, or only just visible above the surface. The earliest formidable turret-ship was the ill-fated *Captain*, which, in 1870, capsized in the bay of Biscay, and entombed 600 brave seamen, with the inventor, capt. Coles. Ships of analogous construction, with lower freeboard, have been since built; and now the *Inflexible*, of 11,165 tons, carrying 4 guns of 81 tons, is probably the most powerful war-ship that ever floated.

The expenditure on the B. N. greatly increased between 1839 and 1875, on account of the changes just adverted to. In 1839, the number of men and boys voted was little over 25,000; in 1878, it was about 60,000. Even as late as 1852, the expenditure was only £6,500,000, against £10,589,984 in 1879–80; £11,155,900 in 1882–83.

The B. N. is at present composed of 75 ironclads, about 360 steam-vessels, and 120 sailing-vessels. In the beginning of 1882, there were in commission 253 vessels. The unarmored ships comprise cruisers, dispatch vessels, gun-boats, several large old-fashioned two-deckers, troop-ships for India, tugs, old wooden vessels for harbor service.

All matters about ships, seamen, etc., will be found under their proper headings. See TURRET-SHIP; also ARMOR-PLATES and WAR-SERVICES.

BRITON-RIVIERE. See page 878.

BRITON. See BRITANNIA, *ante*.

BRITTANY. See BRETAGNE.

BRITTON, the title of the earliest summary of the laws of England in the French language, purporting to have been written by the command of Edward I. The compiler is unknown.

BRITTON, JOHN, an eminent English topographical and antiquarian writer, the son of a small farmer and village shopkeeper, was b. July 7, 1771, at Kingston-St.-Michael, near Chippenham, Wiltshire, and losing his parents young, received but a scanty education. Some short notices which he had contributed to the *Sporting Magazine* brought him into acquaintance with its publisher, Mr. Wheble, who employed him to compile the *Beauties of Wiltshire*, which he did in conjunction with a young literary friend named E. W. Brayley. They also prepared the *Beauties of Bedfordshire* in the same manner. B. afterwards issued a more elaborate work, entitled the *Architectural Antiquities of England*. One of the most important of his subsequent publications was *The Cathedral Antiquities of England*, 14 vols. fol. and 4to, 1814–35, with upwards of 300 highly finished plates. Altogether, his illustrated works of architectural and topographical description and antiquities number 87, besides others of a similar kind which he edited.

BRIVE, a t. of France, in the department of Corréze, pleasantly situated in the midst of vineyards, and shut in by a fine circular avenue of elms, about 15 m. s.w. of Tulle. It has manufactures of woolen, cotton-yarn, etc. Pop. '72, 8016.

BRIXEN, a t. of Austrian Tyrol, at the confluence of the Eisack and the Rientz, 104 m. from Vienna by rail. It is a bishop's see, and has a cathedral, several monasteries, a theological seminary, and a gymnasium. There are iron and steel factories in the neighborhood. Nine miles away is the great fort of Franzensfeste, built in 1838. B. is mentioned in 901; it was walled in in 1038; was burnt in 1174, 1234, and 1445; in 1519,

it was stormed by the French, and in 1525 suffered from the rebellion of the peasants. Pop. '69, 4349.

BRIXHAM, a market-t. and seaport of Devonshire, England, beautifully situated on the s. side of Torbay, 5 m. s. from Torquay, and 22 m. directly s. from Exeter. The town occupies the sides of two hills, and is divided into two parts, called upper and lower B., the former consisting chiefly of a long straggling street. Some of the more recently erected parts of the town are well built, and contain good houses, but the older parts are mean. The prosperity of B. depends chiefly on its fisheries, it being the head-quarters of the great Devonshire fishery of Torbay, in which many vessels are employed, mostly trawlers, of which there are about 200. These are decked sloops of 40 to 50 tons burden, and generally managed by three men and a boy. Great quantities of fresh fish are sent to London, Bath, and Bristol. Considerable quantities of iron ore are raised in the neighborhood and shipped here. B. has also a number of vessels engaged in the coasting and foreign trade, the foreign trade being chiefly with the Mediterranean. The admiralty have an establishment here for watering the navy. Near B. is a station of the South Devon branch of the Great Western railway. It was at B. that the prince of Orange, afterwards William III., landed, Nov. 4, 1688. Pop. '71, 4941 ; '81, 7033.

BRIZA. See QUAKING GRASS.

BRIZURE, BRIZÉ or BRISÉ, terms used in heraldry to indicate that a charge is bruised or broken. See ROMPU.

BROACH, or BROCHE, an old English term for a spire springing directly from a tower without any intermediate parapet. Such spires are common in England, and in some places in Scotland, particularly in Fife.

BROACH, a t. in India. See BAROACH, *ante.*

BROAD ARROW, a government mark, stamped, cut, or otherwise fixed on all solid materials used in her majesty's ships or dock-yards, and on government stores generally, in order to prevent embezzlement. The origin of the mark is obscure. Previous to the year 1698, the naval authorities prosecuted a dealer in marine-stores, for having in his possession certain stores bearing the B. A. of his majesty. The defendant allowed the evidence against him to go on, and when asked what he had to say, replied that it was *very curious* that the king and he, as a dealer, should both have the same private mark on their property! The receiver of stolen goods was acquitted, and this led to the passing of the act 9 and 10 Will. III. c. 41 (1698), which enacts that persons in possession of naval stores, or goods of any kind marked with the B. A., or other marks therein mentioned, and usually employed in marking naval stores for the navy, shall forfeit all such goods and $200, and also pay costs. The mark is for iron, wood, etc., what the color-thread is for sailcloth and ropes, which enables the government to identify the smallest piece of such articles.

BROAD-BILL. See SHOVELER.

BROAD-BOTTOM ADMINISTRATION, a name derisively applied to the ministry formed by Henry Pelham in 1744, because it professed to include all parties of weight and influence in the state in a grand coalition, and comprised no less than nine dukes—viz., Dorset, Newcastle, Montagu, Bedford, Grafton, Richmond, Argyle, Devonshire, and Bolton, the first seven of whom were of the cabinet. Besides the prime minister, Pelham, the other principal members of the cabinet were earls Gower and Harrington, the marquis of Tweeddale and lord Hardwicke. From this B. B. A. the particular adherents of Pulteney (newly created earl of Bath) and lord Cateret were carefully excluded. The ministry was dissolved in 1754, by the death of Pelham, though several of its original members had seceded long before.

BROADCAST, a method of sowing grain, which distributes it with some degree of uniformity over the surface. When the sowing is done by hand, the seed is carried in a bag at the left side, and is scattered with the right hand while the sower walks on with measured tread. The seed is afterwards covered with a harrow, or by dragging brush over it. Machines have been devised for sowing grain in this manner. The method of sowing by the drill is preferred by most intelligent farmers.

BROAD CHURCH, the name given to a portion of the church of England which holds a position unidentified with either the High or the Low church party. The High church branch holds rigidly to apostolic succession, maintains the divine right of episcopacy, and in general the sacramental view of the church and the Christian life; of this company are those known as "Ritualists," though not all who are High church would accept the name of Ritualists, (See RITUALISM.) From this section came those known a few years since as "Puseyites." The Low church section recognize non-prelatical bodies of Christian believers as in some sense churches; in doctrine they are mainly Calvinists; they are often called Evangelicals. The Broad church section are the latest of the three divisions, but embrace a large number of churchmen of high cultivation and talent, such as dean Stanley, canon Kingsley, Maurice, and others of note. The tendency of the Broad church leaders is towards a liberal view both of Christian doctrine and church organization. Yet the High on the one hand, the Low on the other, and the Broad between the two subscribe to the same formularies, which they interpret

in differing senses, and from which they deduce opposite results. It should be understood that these names are used only colloquially for popular convenience, and are not accepted in either England or America as legitimate designations. They show tendencies.

BROADCLOTH. See Woolen and Worsted Manufactures, *ante.*

BROADDUS, Andrew, d.d., 1770–1848; a Virginian; a Baptist preacher, compiler of the *Dover Selection* and *Virginia Collection* of hymns, and a popular pulpit orator. Some of his sermons have been published.

BROADHEAD, James O. See page 878.

BROADHURST, Henry. See page 878

BROAD MOUNTAIN, in the coal region, Carbon and Schuylkill cos., Penn. It is about 2000 ft. high and extends for 50 m. n.e. and s.w.

BROAD RIVER, a stream of North and South Carolina rising in the Blue Ridge, and joining with the Saluda, forming the Congaree. The city of Columbia is at the junction of the two rivers. The country around B. R. is exceedingly fertile and productive.

BROADSIDE, in naval warfare, is the simultaneous discharge of all the guns on one side of a ship of war. The fighting power of a ship is sometimes estimated by the weight of her broadside, i.e., the weight of all the shot and shell that can be fired off at once from one side or half of the ship. Thus, the broadside of the old-fashioned *Duke of Wellington*, 131-gun war-steamer, amounted to 2400 lbs. One reason why a paddle-steamer is not so good for war purposes as a screw-steamer, is because the paddle-boxes and wheels interfere with the broadside. With the introduction of iron-clad turret-ships the term is becoming less applicable.

BROADSTAIRS, a t. in England 1½ m. s. of North Foreland and 3 m. from Margate. It has a small pier built early in the 16th c., and an archway leading to the shore built in 1540. Near the pier is a chapel to the Virgin, in honor of which ships were once accustomed to furl their topsails as they passed. B. is a place of summer resort. Pop. '71, 1926.

BROADSWORD is a sword with a broad blade, for cutting only, not for stabbing, and therefore not sharp at the point, like a saber. It is but little used in the British army.

BROAD TOP MOUNTAIN, in Bedford and Huntingdon cos., Penn., 2500 ft. above the sea. It has large beds of bituminous coal.

BROADUS, John Albert, d.d., ll.d., b. Va., 1827; educated in the university of Virginia; pastor of the Baptist church in Charlotteville, and in 1859 professor of New Testament interpretation and homiletics in the Southern Baptist theological seminary in Greenville, S. C. Dr. B. is proficient as a Greek scholar. He has published, among other papers, *The Preparation and Delivery of Sermons* and *Recollections of Travels.*

BROCADE. This term is used to describe a silken fabric on which a figure of any kind is formed by the threads of the warp or weft being raised by the heddles, or, more generally, by the Jacquard-loom, in such order as to produce the pattern required. The word has much the same application to silk textures that damask has to linen textures or to worsted textures for upholstery uses. See Weaving and Jacquard-loom.

BROCAGE. See Broker.

BROCAGE BONDS to procure **MARRIAGE**, or Marriage Brocage Bonds, as they are otherwise called, are void by the law of England, being against the policy of the law and the freedom of marriage. See Hurlstone's *Law of Bonds*, 1835, p. 15, and authorities there referred to. The Scotch law is the same.

BROCCOLI, a well-known and much esteemed garden vegetable, one of the many varieties which cultivation has produced of the *brassica oleracea*, the common kale or cabbage. B. is said to have been originally brought to Italy and other parts of Europe from the isle of Cyprus about the middle of the 16th century. Its name is probably of Italian origin. It differs little from cauliflower (q.v.), of which it may be considered a mere variety, having colored instead of white heads, and a deeper tinge of color in the leaves, being also more hardy, the character from which its chief importance is derived, as it can be readily obtained at seasons when there is no cauliflower in the open garden. It is perhaps inferior to cauliflower, however, in delicacy of flavor. There are many subvarieties, the number of which is, of course, continually increasing; and some of these are preferred for early spring sowing, with a view to an autumn crop; others for later sowing, with a view to a crop in the following spring. The subvarieties differ in size, in their more cut or entire leaves, in the greater or less degree of color—generally purple—with which the leaves are tinged, in the more or less compact form of the whole plant, in the more or less green, yellow, or purple color of the head, etc. Some of the kinds of B. preferred for late sowing and spring use are known by the general name of cape B., the first of them being said—but on doubtful authority—to have been introduced into Britain from the cape of Good Hope. The mode of cultivation of B. pretty much resembles that of cauliflower, except as to the times of sowing and transplanting, and that it is generally—even in Scotland—sown in the open ground, and not in a hot-bed. A similar richness of soil is required. Various modes of protection in winter are adopted. In mild winters, protection is scarcely or not at all needed, but precautions

are generally employed against severe weather. It is found very advantageous to plant in trenches of 6 in. deep, and to earth up the plants, as they are thus not only in some measure preserved from frosts, but also from the winds of winter, which are apt to shake and loosen plants, so as to cause their destruction. It is a common practice to take up some of the most advanced plants in the beginning of winter, and to lay them in a sloping position with their heads towards the north. The heads produced in this way are not in general so large as they might be, but they are sometimes procured when otherwise they probably would not.

BROCCHI, Giovanni Battista; an Italian geologist, 1772–1826. He studied at Pisa, and was professor of botany in 1802 at Brescia, but devoted himself chiefly to geology. In 1808, he was made inspector of mines for Italy. In 1823, he went to Egypt, and two years after Mehemet Ali made him one of a commission to organize for the conquest of Sennaar. B. fell a victim to the climate at Khartoom. Among his works are *Treatise on the Iron Mines of Mella; Essay on the Physical Constitution of the Metalliferous Mountains of the Valley of Trompia; Mineralogy of the Valley of Fassa and the Tyrol; Fossil Geology of the Apennines*, etc.

BROCHURE, a French word (from *brocher*, to stitch), equivalent to the English word pamphlet (q.v.).

BROCK, Sir Isaac, an English gen. killed in the battle of Queenstown, Canada, Oct. 13, 1812. Not long before, he had captured gen. Hull (suspected of treason) and his forces. There is a monument to his memory on the w. bank of the Niagara river.

BROCK, Thomas. See page 879.

BROCKEN (*Mons Bructerus, Melibocus* of the ancient Romans), popularly known as the *Blocksberg*, is the highest summit of the Harz mountains. It is situated in the province of Saxony, Prussia, about 20 m. w.s.w. of Halberstadt, and has an elevation of 3740 ft. above the sea. The mountain is very frequently veiled in mist and cloud-strata, and is celebrated for the phenomenon known as the *Brockengespenst* ("spector of the Brocken"), which is nothing more than the shadow of men, houses, or other objects thrown upon the misty eastern horizon by the light of sunset. (See *Gallery of Nature*, published by W. & R. Chambers.) In clear weather, a fine view is obtained from the summit of the Brocken.

BROCKETT, Linus Pierpont, M.D., b. Conn., 1820; graduated from Yale medical college in 1843. After a few years he left medical practice for literature, and has written for the *New American Cyclopædia*, etc. Among his separate works are *Our Great Captains; Woman's Work in the Civil War; Woman, her Rights, Wrongs, Privileges, and Responsibilities;* and *Epidemic and Contagious Diseases, their History, Symptoms, and Treatment.*

BROCKHAUS, Friedrich Arnold, the founder of the well-known firm of B. in Leipsic, and publisher of the *Conversations-Lexicon*, was b. at Dortmund, May 4, 1772. In 1802, circumstances led him to Holland, where, however, his business schemes did not prosper. He returned to Germany in 1810, and in the following year commenced business in Altenburg. Before this, however (in 1808), B. had purchased the copyright of the *Conversations-Lexicon*, which had been commenced in 1796, and he completed the first edition, with the addition of two supplementary volumes, in 1809–10. In 1812, a second improved edition of the work was commenced under the supervision of B. as editor. The peace of 1815 enabled B. to pursue prosperously his peaceful and civilizing career. In 1817, his business had so increased, that he found it necessary to leave Altenburg for Leipsic, where, in the following year, he commenced book-printing in addition to book-publishing. In the course of a few years, the *Lexicon* passed through six editions; it has now arrived at the eleventh edition. Through all the enterprises of B. as a publisher, a zealous devotion to the cause of liberty and general enlightment may be traced. He died Aug. 20, 1823. B. was not only an able and assiduous man of business, but distinguished for his literary culture, his knowledge of the world, and his numerous social accomplishments. He was also eminently patriotic, and furthered many literary undertakings, simply through a pure love of "fatherland."

The business was afterwards carried on by Heinrich B., second son of the former (b. 1804, d. 1874), and now by Heinrich's sons, Rudolf and Edward. Among the numerous publications issued by the house, may be mentioned the later editions of the *Conversations-Lexicon*, with an *Atlas;* the *Universal Encyclopædia*, by Ersch and Gruber; and the German *Penny Magazine*, founded in 1833.

Brockhaus, Hermann, third son of F. A. Brockhaus, was b. at Amsterdam, Jan. 28, 1806; studied at Leipsic, Göttingen, and Bonn, and lived successively in Copenhagen, Paris, London, and Oxford. From 1848 till his death in 1877, he held at Leipsic the chair of ordinary professor of the Sanscrit language and literature. Among his several works on oriental literature may be mentioned the *First Five Books of the Large Collection of Fables, Kathâ Sarit Sâgara, in Sanscrit and German* (1839); an edition of the drama *Prabodha Condrodaya*, by Krishna Misra, with Hindu scholia (1845); Nachschebi's Persian version of the *Seven Wise Masters* (1845); and (in 1854) the Persian text of the *Songs of Hafiz*. After 1856, he was editor of the *Universal Encyclopædia*. B.'s method of printing Sanscrit in Roman types is now generally adopted in Germany.

BROCKPORT, a village in Monroe co., N. Y., on the Central railroad and Erie canal, 18 m. w. of Rochester; noted for manufactures, especially of pumps and agricultural machines. There is a state normal school here. Pop. '80, 4039.

BROCKTON, a t. in Plymouth co., Mass., on the Old Colony railroad, 20 m. s. of Boston; pop. '80, 13,608. The manufacture of boots and shoes is the chief industry.

BROCKVILLE, a t. of Upper Canada, or Ontario, taking its name from gen. Brock, who, during the last American war, died in the arms of victory on Queenston heights, between the town and falls of Niagara. It stands on the left bank of the St. Lawrence proper, about 40 m. below Kingston, and about 160 above Montreal. Originally, its communications downward were interrupted by powerful and rugged rapids, which, however, are now, one and all, either avoided by canals or overcome by steam. B. is a thriving place, with (1881) 7609 inhabitants, on The Grand Trunk Railway.

BRODERICK, David Colbreth, 1818–59; b. Washington; an energetic uneducated man, who became a political leader in New York city, and was elected to congress. In 1849, he went to California, and in 1856 was chosen United States senator. In consequence of some plain words, B. was challenged by David S. Terry, a judge of one of the state courts, and fell in the duel which followed.

BRODERIP, William John, 1787–1859; an English writer on natural history. He studied law, practiced, edited law reports, and was for 34 years a metropolitan police magistrate; but his leisure was devoted to science, and he was a member of most of the important societies, contributed to their *Transactions*, and promoted especially the study of zoology, being many years vice-president of the zoological society. Much of his scientific writings appeared in *Fraser's Magazine*.

BRODHEAD, John Romeyn, ll.d., 1814–73; b. Philadelphia; a graduate of Rutgers college, and a student at law, but after brief practice he turned his whole attention to American history, especially that concerning the early settlement of New York. In pursuit of this object, while connected with the United States legation in Holland, he thoroughly searched the archives at the Hague and elsewhere in that country, and in England and France. His great labor was rewarded by the collection of more than 5000 documents, more or less important, of which many had until then been unknown to historians. These papers were printed by the state of New York in several large folio volumes. In 1846, B. was secretary of legation in London, where he wrote the greater part of his *History of the State of New York.*, the last volume of which was published in 1871. From 1853 to 1857 he was naval officer of the port of New York. He was a leading member of the New York historical and other learned societies in this country and abroad.

BRODIE, Sir Benjamin Collins, Bart., a distinguished surgeon, third son of the rev. Peter Bellinger Brodie, rector of Winterslow, Wiltshire, was b. there in 1783. He studied under sir Everard Home at St. George's hospital, to which he was, in 1808, elected assistant-surgeon, and afterwards surgeon. He had previously lectured both on anatomy and on surgery. In 1810, he was elected a fellow of the royal society, and in 1811 received their Copley medal for his physiological papers contributed to the *Philosophical Transactions*. In 1834, he was created a baronet, and he held the appointment of sergeant-surgeon to queen Victoria, as well as that of first surgeon in ordinary to the prince consort. He was made d.c.l. of Oxford in 1850; was president of the royal society; a corresponding member of the institute of France, and a foreign member of other learned societies and academies in Europe and America. Author of *Lectures on Local Nervous Affections* (1837, 8vo); *Hunterian Oration*, 1837; *Lectures Illustrative of Subjects in Pathology and Surgery* (1840, 8vo); *Introductory Discourse on the Duties and Conduct of Medical Students* (1843, 8vo); *Psychological Inquiries as to Mental Faculties* (3d ed., 1856); an edition of his works with *Autobiography* appeared in 1865. He also contributed papers to several scientific journals. He died in 1862.—B.'s son, sir B. C. Brodie, f.r.s., was in 1855 elected Aldrichian prof. of chemistry at Oxford, a chair suppressed in 1866.

BRO'DY, a t. of Galicia, Austria, s situated on a swampy plain, surrounded by forests, about 58 m. e.n.e. of Lemberg. B., which was made a free commercial town in 1779, has a large trade in the agricultural produce of the country with Russia, Poland, and Turkey. Its chief manufactures are leather and linen; jewelry, manufactured goods, and colonial produce are imported by way of Odessa. The trade is almost entirely in the hands of the Jews, who form so large a proportion of the inhabitants, that B. has been called "The German Jerusalem." Pop. '69, 18,890; '80, 20,071.

BROG, or Brogue, a rudely formed species of shoe, formerly in use by the aboriginal Irish and the Scottish Highlanders, and of which there were different varieties. See Shoes, Shoe-trade, The name has been applied to a modern kind of shoes, with some fanciful peculiarities.—The term brogue is also used to signify the peculiar pronunciation of English that distinguishes natives of Ireland.

BROGDEN, Curtis H. See page 879.

BROGLIE, Achille Léonce Victor Charles, Duc de, 1785–1870; a peer of France. The family was Piedmontese, but won distinction in the armies of France. The first marshal de B. served under Louis XIV.; his son reached the highest grade of

the French peerage; the second marshal commanded in the seven years war, was made a prince of the empire, and by Louis XVI. made commander-in-chief. He refused to serve under Napoleon, and died in voluntary exile. His son followed Lafayette to America, but soon returned, served on the staff in the republican army of the Rhine, was denounced, arrested, and guillotined, June 27, 1794. His injunction to his son (the subject of this sketch, then but 9 years old) was to remain faithful to liberty even though she were ungrateful and unjust. "His father murdered, his mother in prison, his property confiscated and plundered, the young de Broglie first appears in life in wooden shoes and a red cap of liberty, begging an assignat from the younger Robespierre." Yet he adhered to the cause for which his father died, and maintained through life the principles of 1789, seeming to have forgotten even his rank until reminded of it by a summons to the chamber of peers. Early in life he was one of Napoleon's council of state. With high rank, independent fortune, unblemished integrity, unflinching patriotism, and a sincere and consistent attachment to liberal opinions, B. entered the chamber in 1815, just before he was 30 years old. His first opportunity was on the trial of marshal Ney, and he alone had the courage to speak and vote for acquittal on the ground that the marshal was not guilty of premeditated treason. During the restoration he was active in the defense of liberal opinions and measures, opposing the reactionary policy of the court, and acting with the doctrinaires, of whom Guizot was the ablest representative. In 1816, he married Mme. de Stael's daughter. About the same time he became an ally of Clarkson and Wilberforce in the cause of the emancipation of negroes from slavery. In Louis Philippe's first cabinet he reluctantly took the bureau of public worship, and in 1832, upon strong urging, became Cassimir Perier's successor as minister of foreign affairs, in which office he strengthened the bonds between France and England, negotiated the quadruple alliance, assisted in settling the Belgian and Greek questions, and labored with success to preserve the peace of Europe. In 1835, he was the head of the cabinet, and, riding beside the king when Fieschi's attempt at regicide was made, B. received one of the bullets through his coat collar. He retired permanently from public life in 1836. Though not in office, B. preserved through life close personal and political friendship with Guizot. The overthrow of the constitutional monarchy in 1848 was a severe blow to the duke; but he consented to sit in the republican assemblies, and labored to counteract some of what he deemed to be the evils of universal suffrage and to avert the *coup d'état* which he saw was impending. When it came he was conspicuous as one of the bitterest enemies of the imperial regime, though he admitted that an empire was "the government which the poorer classes of France desired, and the rich deserved." His last 20 years were devoted to philosophical and literary pursuits. With regard to the future, he said: "I shall die a penitent Christian and an impenitent liberal." He was a member of the academy and other societies, in whose labor he took assiduous interest. He was succeeded by Albert de B., his eldest son, also of literary distinction, who has had a prominent part since 1871 in the national assembly, and was for some time the head of marshal MacMahon's cabinet.

BROGLIE, Albert, Duc de, son of Achille, b. 1821; statesman and author, elected a member of the academy in 1862. His main work, *The Church and the Roman Empire in the Fourth Century* has passed through several editions. He has also published Leibnitz's *System of Religion; Questions of Religion and History*, etc. M. Thiers made him minister of foreign affairs, and ambassador to Great Britain.

BROHAN, Joséphine Félicité Augustine, b. 1824; a French actress, excelling specially in the higher dramas, such as those of Moliere, Beaumarchais, and Victor Hugo. She has also produced some pieces of her own. On the death of Rachel she took the great tragedienne's chair in the conservatory. Her two sisters are well known on the stage; Suzanne, and Emilie Madeleine.

BROILING is a convenient and expeditious mode of cooking small pieces of meat, by laying them on a gridiron over a bright fire, or even on the coals themselves. This is perhaps the most primitive mode of preparing meat for eating, as may be supposed from the great ease and simplicity with which the operation is managed. B. is, in fact, a quicker sort of roasting. The albumen of the outside being sealed up at once, the meat is rendered extremely nutritious, and therefore this process is much to be recommended. But to broil meat so as to preserve its odor, juice, and fat, requires care. The meat should be prepared for the gridiron by being beaten slightly with the rolling-pin, trimmed of superfluous fat and skin, and cut so as to look well on the dish. The fire should be perfectly clear, and of a red-hot surface to answer to the size of the gridiron, that all parts of the meat may be equally cooked. Just before setting the gridiron over, some salt should be sprinkled on the fire to prevent the flare. The gridiron should be perfectly clean and smooth, being always rubbed when it is put away; and, before using, it should be warmed, greased with suet, and rubbed again with paper. When it is placed on the fire, the back should be higher than the front. The meat should never be touched with a fork, but turned rapidly with the broiling tongs; and when sufficiently done, should be served immediately on a very hot dish, being seasoned according to taste, In large ranges there should be a broiling stove, and an apparatus for B. suited to it; by this the heat of the fire can be easily regulated. But for all ordinary purposes, a fire of charcoal, or of common coal, and a grooved gridiron, to preserve

the gravy, is all that is necessary. Sometimes a gridiron is used to hang before the fire, when a dinner is being dressed and the top of the fire occupied; this is convenient, but it is an inferior way of cooking, the meat being roasted rather than broiled. There is a gridiron sold in the streets which is very well adapted to small low fires, as it is easily put in between the bars.

BROKE, Sir Philip Bowes Vere, 1776–1841; an English admiral of the war of 1812; he commanded the *Shannon*, and sent a challenge to fight to the American capt. Lawrence, just promoted to the command of the *Chesapeake*. Before the latter arrived, Lawrence, who thought the mere appearance of a British vessel to be a challenge, went out to meet him. An action ensued, June 1, 1813, in sight of the land off Boston. Lawrence was almost immediately mortally wounded, and his badly supplied and badly manned vessel was captured. The victory raised B. to knighthood.

BROKEN KNEES. The part commonly termed the knee of the horse is the carpus or wrist of man, and from the peculiar conformation of a quadruped, is much exposed, and liable to serious injury. By *broken knee* is meant the abrasion or more serious injury of the joint by a fall; and even when the wounds are healed, the scar usually remains to indicate that the horse has once fallen, and is "broken-kneed." An animal is then regarded as unsafe, and seriously deteriorated in value.

Causes.—The fall is necessarily the immediate cause of the broken-knee; as to the cause of the fall, it is usually to be looked for elsewhere than in the horse himself. As a rule, the safety of a horse's action is very great, particularly about the age of from four to seven or eight years. Rarely does a horse at any age fall on his knees, unless his feet have suffered from improper shoeing; the animal then moves cautiously, and is very apt to "stumble." Undoubtedly, some horses of defective conformation and sluggish disposition are more likely to stumble and fall than a well made, high-actioned steed; nevertheless, the most perfect animal may gradually be rendered unsafe by improper shoeing. See Shoeing of Horses.

Symptoms.—It is important, so soon as the injury is done, to determine the extent and depth of the wound. If it be merely a superficial wound, the case is a simple one; and unless the skin is much bruised, the hair will grow, and the animal not be permanently blemished. The sheath, however, through which the tendon over the joint passes, may be opened, and the tendon itself injured. The wound is then gaping, heals rather slowly, and sloughs have to be thrown off. Lastly, the joint itself may be opened, and this is indicated by a free discharge of the joint-oil or synovia, and by the bones being seen or felt on probing. The worst form of accident is that when the bones of the joint are fractured. The system suffers when the wounds are serious, and severe fever sets in.

Treatment.—Whatever may be the form of injury, the first injunction is to wash the wound thoroughly with cold water applied constantly for hours. The joint will swell, become hot and painful, and in some cases irritative fever occurs. Then the animal should be kept on low diet, and be purged with four, five, or six drachms of aloes, according to its size, etc. Should the wound be deep, much dirt remaining in the tissues, a large linseed-meal poultice should be applied over the joint for a day or two, until free suppuration sets in. If this is retarded, and in all cases when the poultice does not appear necessary, cold fomentations may be continued, using either some infusion of chamomile, or one part of tincture of arnica to twelve of water, or one part of Goulard's extract to a similar quantity of water. The severe symptoms speedily subside, unless the bones are fractured or the joint otherwise seriously injured. Usually, the wound heals rapidly, the joint-oil ceases to flow; and in order to insure a contraction of the wound, mild astringent or caustic applications should be used, such as tincture of myrrh, sulphate of zinc lotion, or sulphate of copper in crystal rubbed over it. When the wound is thoroughly healed, the hair may not grow rapidly, even in parts where it should form; in this case its production may be accelerated by the use of a very mild cantharidine ointment, which should act as a mild irritant, but not as a blister. In some cases of severe broken knee, it is advisable to fix the limb so that the animal may not move the joint much. In veterinary jurisprudence, a broken knee is regarded as a *blemish*, not as an unsoundness.

BROKEN WIND, a disease or unsoundness of the respiratory organs of the horse, which, from the French *pousse*, was termed, by some of the old English writers on farriery, *pursiness*. The Germans term it *dämpfigkeit*, or asthma, though in many of their works it receives also the name of *herzschlägigkeit*, from a belief that it consists in palpitation of the heart. The nature of the malady is not well understood, though it appears in the form of difficulty in the act of expiration, the horse making an extraordinary or spasmodic effort to expel from the lungs the air which has readily entered them in inspiration.

Symptoms.—A broken-winded horse is usually an animal that does not thrive, is lean, and has a dependent belly, the muscles of which are unusually active as expiratory muscles. The characteristic symptoms are best observed when the horse is exercised, the breathing becoming very labored, the nostrils dilated, the eyes bloodshot, and even blue, showing imperfect purification of blood in the lungs. On watching the chest and flank, the ribs are observed very actively moved, and after collapsing, when the air is expelled from the lungs, are further depressed by a spasmodic jerk brought about by the

abdominal muscles. A broken-winded horse has a bad cough, of the kind referred to by veterinarians as characteristic of unsoundness, and termed a *hollow cough*. When the animal is oppressed by fast work, or dragging a load up a hill, the pulse is excessively rapid, and the heart beats energetically. From this circumstance, it is regarded by some as a disease of the heart. Others have believed the diaphragm affected, but in reality it is the lungs, or the apparatus for expelling the air from these organs, that is at fault. The diaphragm being a muscle of inspiration, it is probably in no way implicated. No doubt, when the heart is diseased, the function of breathing is sometimes much affected, but these are not the symptoms of the true broken-wind, any more than when the lungs are in part rendered impervious to air, and the act of inspiration is rendered short. This condition constitutes *thick wind*, and is often one of the remote results of inflammatory disease of the lungs.

Causes.—Low-bred horses are liable to B. W., especially if improperly fed on innutritious and bulky food, and at the same time kept at hard and fast work. Whatever may be the way in which the condition of the alimentary canal operates in producing B. W., of this we are certain, that the function of digestion is much impaired. Indeed, the term B. W. is believed to have had reference originally to the constant escape of flatus. B. W. is far more rare now-a-days than of old, and it is at present most common in those countries where horses are worst managed, and fed almost exclusively on coarse, indigestible, or innutritious kinds of hay and beans.

Treatment.—The treatment of B. W. is very unsatisfactory; and we can only hope for palliation of the symptoms by keeping the alimentary canal in proper order, administering occasional purgatives, and feeding on a proper quantity of the best oats, which should always be bruised; also allowing the horse the best hay in spare quantities—viz., from 10 to 12 lbs. daily. Some veterinarians have vaunted their powers of curing this disease, and recommended large doses of camphor, digitalis, and opium; but these potent narcotics only operate for a very short time, and as their effects pass off, the symptoms return, and often with increased severity. We may say that B. W. is incurable; and horses very frequently drop down exhausted when at hard work, and die either from congestion of the lungs, hemorrhage, or simple suffocation.

B. W. is so bad a form of unsoundness that horse-dealers sometimes attempt, and even successfully, to hide the defect for the time they may be engaged in the sale of a horse, and this they do by causing the animal to swallow *shot* or *grease*. A certain portion of lead weighing in the stomach has a wonderful effect in diminishing the symptoms, which become again obvious enough for a few hours after the ruse has been practiced on some unwary purchaser.

BROKER (so called, from a Teut. and Slav. root, *brak* or *wrak*, signifying refuse, blemish; as if the function had originally been to select good articles of merchandise and reject blemished ones: the German term is mäkler, from *makel*, blemish), an agent employed to make bargains and contracts between other persons, in matters of trade, commerce, and navigation, for a compensation commonly called brokerage. Where he is employed to buy or sell goods, he is not intrusted with the custody or possession of them, and is not authorized to buy or sell them in his own name. In this respect, he differs from a factor, and he differs from an auctioneer in two particulars: a B. may buy as well as sell, but an auctioneer can only sell; a B. cannot sell personally at public auction, for that is the appropriate function of an auctioneer, but he may sell at private sales, which an auctioneer (as such) does not. A B. is strictly a middleman, or intermediate negotiator between the parties, and for some purposes, he is treated as the agent of both parties, but primarily he is deemed merely the agent of the party by whom he is originally employed. There are several sorts of brokers, such as stock-brokers, share-brokers, ship-brokers (q.v. in Supp., Vol. X.), insurance-brokers, and bill-brokers (q.v.). Persons who appraise goods, sell or distrain furniture for rent, are also called brokers, although differing entirely in their occupations from the preceding commercial agents. The business of a pawnbroker (q.v.) is also of a different nature.

Brokers, in London, must be admitted by the lord mayor and aldermen, paying £5 on admission, and a like sum annually, under a penalty of £100; but they are no otherwise subject to the control of the court of aldermen. A list is kept by the city of brokers admitted, and of those who have been convicted of fraud or disqualified (33 and 34 Vict. c. 60).

By the larceny consolidation act, 24 and 25 Vict. c. 96, s. 76, it is enacted that any person, who, being a banker, merchant, B., attorney, or agent, and being intrusted for safe custody with the property of any other persons, shall in any manner convert or appropriate it to his own use, shall be guilty of a misdemeanor, and be liable to be kept in penal servitude from five to seven years, or to suffer some other punishment, by imprisonment for not more than two years, with hard labor or confinement. See Factor.

BROKER (*ante*). In the United States, brokers are classed according to the nature of their business. In general, the word means a dealer in money or stocks; but besides the bill and note broker there are exchange, insurance, cotton (and other merchandise), pawn, real estate, and ship brokers. The B. is paid by a commission on his sales, or by a special agreement. Usually brokers do not disclose the names of their principals.

There is an implied warranty in dealing with a broker that the thing he sells is all that it pretends to be, and if a bill sold be found a forgery, he is held responsible.

BROKERAGE is the remuneration or compensation allowed to a broker (q.v.).

BROMBERG, a t. of Prussia, in the province of Posen, 69 m. n.e. from the city of that name, is situated on the Brahe, about 6 m. from its junction with the Vistula. B. has manufactures of woolens, linen, chicory, tobacco, and Prussian blue; a large sugar-refinery, distilleries, breweries, potteries, and corn-mills. The *Bromberg canal*, by uniting the rivers Netz and Brahe, connects the Oder and Elbe with the Vistula. Pop. '75, 31,308.

BROME, a co. in the province of Quebec, Canada, on the Vermont border; 350 sq. m.; pop. '81, 15,827. The Green mountains occupy a portion of the county. Capital, Knowlton. The Southeastern Railway passes through the co.

BROME-GRASS, *Bromus;* Gr. *bromos*, a kind of oat; a genus of grasses, very nearly allied to fescue (q.v.), with flowers in lax panicles, glumes many-flowered, the outer palea bifid at the extremity, and awned beneath, and the very short stigma growing from the face of the germen, beneath its apex. The species are numerous, and some of them are very common British grasses—none more so than the Soft B. (*B. mollis*), an annual or biennial, which has very soft downy leaves, grows well on poor soils, and is readily eaten by cattle, but is not much esteemed by farmers, either for the quantity or quality of fodder which it yields. Its seeds have also the reputation of possessing deleterious or poisonous properties: and those of two other species of this genus, *B. purgans* and *B. catharticus*, the former a native of North America, and the latter of Chili, are said to be emetic and purgative. The whole subject of the existence of poisonous properties in the seeds of any of these grasses, requires further investigation. Soft B., although now disliked by farmers, was formerly sown as a fodder-grass, and its large seeds were even regarded as making hay more nutritious; so that there are some who view its present proscription as a thing which ought to be reconsidered, and who deem it not improbable that its weighty produce, both in foliage and seeds, and its adaptation to poor soils, may yet recommend it to the favor of agriculturists. Very similar to it are Smooth B. (*B. racemosus*), Field B. or Meadow B. (*B. commutatus* or *B. pratensis*, and *B. arvensis*), all of which seem very much to resemble it in their properties.—The Tall B. (*B. giganteus*, also known as *festuca gigantea* and *bucetum giganteum*), a native of Britain, which reaches the height of 4 or even 5 ft., affords a great bulk of foliage, but is not much relished by cattle. Naturally growing in shady places, it succeeds even in dense woods, and is sometimes sown to form covert for game.—Rye B. (*B. secalinus*) is generally regarded as a troublesome weed, especially in fields of rye. It is very abundant in some parts of Europe. In a young state it has a great resemblance to rye. It seeds, which are large, retain their power of germination for years, and do not lose it by passing through the intestines of animal. Deleterious effects have been erroneously ascribed to bread made from rye, along with which these seeds have been ground; but poultry are very fond of them, as of those of other species of this genus.

BROMELIA'CEÆ, a natural order of monocotyledonous plants, allied to *amaryllideæ* and *irideæ*, stemless, or with short stems, and rigid, channeled, often spiny and scaly leaves. The flowers are in racemes or panicles; the calyx 3-parted or tubular, persistent, more or less cohering with the ovary; the petals three, withering or deciduous, equal or unequal, imbricated in bud. The stamens are six, inserted into the tube of the calyx and corolla, the anthers opening inwards. The ovary is 3-celled, the style single, the fruit capsular or succulent, many-seeded; the seeds with a minute embryo lying in the base of mealy albumen.—The order contains about 170 known species, all natives of the warmer parts of America, although some of them are now naturalized both in Asia and Africa. The best known plant of the order, and the only one much valued for its fruit, is the pineapple (q.v.). B., with their strong spiny leaves, cover the ground in many places, so as to form impenetrable thickets. Many of them are epiphytic, or grow upon trees, without being parasites, particularly the species of *tillandsia*, one of which is the New Orleans moss, long beard, or old man's beard of the West Indies and of the southern parts of the United States, hanging from the trees like the lichens of colder climates. The leaves of some are so formed and placed as to retain near their base a quantity of water, often affording a delicious refreshment to the traveler in a hot climate. The water is, perhaps, of use to the plant itself in droughts. Not a few of the B. are capable of vegetating long without contact with earth, and of sustaining long drought without inconvenience, for which reason, and because of their beautiful and fragrant flowers, some of them are very frequently suspended from balconies in South America as air-plants. But the plants of this order are more generally valuable for their fibers than upon any other account. *Tillandsia usneoides*, the New Orleans moss already mentioned, yields a fiber, easily obtained, and in great abundance, which is used instead of hair for stuffing mattresses. The fibers of the leaves of the pineapple, and of some other species of this order, have been made into fabrics resembling the finest white muslin, whilst they are found also to possess sufficient strength for cordage. It is supposed that the produce of different species of *bromelia* is often included along with that of the American aloe or *agave* (q.v.), under the name of *pita* fiber or pita flax, the appearance and properties of

the fibers being very similar, as well as those also of the fibers of the species of *yucca.* The fiber of the pineapple is, in some countries, very frequently twisted into fishing-lines, and made into nets and into ropes intended for immersion in water, being very little liable to injury from this cause. Abundant as the plant is in its native regions, and now so perfectly naturalized as to form thickets in many parts of the old world, there seems no limit to the quantity of this fiber which might be procured.—The pine-apple cloth of the Philippines is called *pina muslin* and *batiste d'ananas.* It is also sometimes erroneously called *grass*-cloth. "With a magnifier, the fibers may be seen to be very numerous and fine, but not twisted at all, as in grass-cloth or the finest muslins and cambrics." The Philippine pineapple fiber is obtained from a species called by the Spaniards *pigna* or *pina* (a cone), and which has by botanists been named *bromelia pigna,* although some regard it as a mere variety of the pineapple, with small and rather dry fruit. It grows in great abundance in the Philippine islands, and is cultivated by the Chinese near Singapore, and the fiber exported to China. This fiber is prepared also in Malacca, Java, Celebes, etc. When bleached, the pineapple fiber can be spun like flax. A patent for this has been taken out in Britain by Mr. Zincke.

The WILD ANANAS (*bromelia pinguin*) of the West Indies, the *bromelia karatas,* common in South America, the *B. sagenaria,* common in some parts of Brazil, and the *billbergia variegata,* which grows in wild luxuriance in Mexico, where it is called *caroa,* often covering miles of country—all yield fibers which are used for cloth, cordage, nets, etc. The fiber of *bromelia sagenaria* is known as *curratow* fiber. Very strong ropes are made of it.

The genus *bromelia* has a 3-parted calyx shorter than the corolla, and the fruit is succulent. The species are pretty numerous, the leaves of all of them are more or less characterized by spiny serratures. The fruit of *B. pinguin,* already mentioned, affords a cooling juice, which is used in the West Indies mixed with water, to make a drink for patients in fever and dysentery. It is said to be diuretic. A vinous liquor is sometimes made from it.

BROMIC ACID is the only known compound of bromine and oxygen. It is prepared by acting upon bromine (Br) by caustic potash (KO), when much bromide of potassium (KBr) is formed, accompanied by bromate of potash ($KOBrO_5$), a compound of potash and B. acid. It likewise combines with silver, lead, and mercury, yielding salts, all of which are styled bromates.

BROMIDES, the salts of bromine combined with various radicals, such as potassium, sodium, iron, mercury, and others. Alkaline B. crystallize in cubes or right angled prisms, and are easily soluble in water. Bromide of potassium is a universal somnific, and is taken in doses of 20 to 60 grs., or even more. B. are said to be useful in epilepsy.

BROMINE (Greek, *bromos,* disagreeable smell: symb. Br; equiv. 80; spec. grav. 2.96), one of the chemical elements, occurs in combination in sea-water to the extent of about 1 grain to the gallon. It is found more abundantly in certain saline springs, especially those at Kreuznach and Kissengen in Germany. It is also present in water and land plants and animals. In the extraction of B. from concentrated sea-water, from which common salt has been separated in quantity, and which is then called *bittern,* or from salt springs, the liquor—which contains the B., as bromide of magnesium (MgBr)—has a stream of chlorine gas (Cl) passed through it, which forms chloride of magnesium (MgCl), and liberates the bromine. The liquid thus becomes of a more or less yellow tint, and if it be then agitated with ether, and allowed to settle, the latter floats up the bromine. The ethereal solution is then treated with potash, which principally forms bromide of potassium (KBr), and fixes the B., so that the ether may be distilled off. The residue is then treated with oxide of manganese and sulphuric acid in a retort with heat, which results in the liberation and distillation of pure bromine. It exists as a deep red liquid of density 2.966 (nearly 3), which readily evolves red fumes of a very irritating and suffocating nature. It is very poisonous, actually destroying the animal tissues. It is sparingly soluble in water, more so in alcohol and ether, and its water solution possesses great bleaching properties. When raised to the temperature of 145.4° F., it boils, and reduced to 95° F., it becomes a red crystalline solid. B. combines with great rapidity with metals, occasionally with ignition, as with antimony, and forms a class of salts. Treated with hydrosulphuric acid, B. yields hydrobromic acid (HBr), which is the analogue of hydrochloric acid, as B. is of chlorine.

BROMLEY, a t. in England, 10 m. s.e. of London, on high ground n. of the Ravensbourne river. Besides modern institutions there is a college founded in 1666, by bishop Warner, for the residence and support of widows of clergymen. There is also a palace for the bishop of Rochester, to whom the manor has belonged since the time of Ethelbert; and in the garden attached is St. Blaize's well, which was of great fame before the reformation. Pop. of parish in '71, 10,674.

BROMLEY FAMILY. See page 879.

BROMOFORM, the ter-bromide of formyl, analogous to ido-form and chloroform; a heavy, volatile liquid; syn. $CHBr_3$.

BROMSEBRO, a village of Sweden, in the län, and 27 m. s. of the town, of Calmar. It is celebrated as the place where treaties were entered into between Sweden and Denmark in 1541, 1641, and 1645.

BROMSGROVE, a market t. of Worcestershire, England, near the small river Salwarp, 12 m. s. s.w. from Birmingham. It is 1½ m. e. from a station on the Birmingham and Bristol railway. The Birmingham and Worcester canal also passes near it. It is situated in a highly cultivated and richly wooded valley. The principal street is about a mile in length. There is a very flourishing grammar-school, founded by Edward VI. in 1553. The linen manufacture was formerly carried on at B.; button-making and nail-making are at present the principal branches of industry. B. returned two members to the house of commons in the reign of Edward I., but was afterwards disfranchised on petition of the inhabitants themselves, because the trade of the town had declined. Pop. '71, 6967; '81, 7959.

BRONCHI are the subdivisions of the trachea or windpipe. Opposite the third dorsal vertebra, the latter divides into two branches or B., of similar structure to itself—namely, round and cartilaginous in front; and flat, with muscular and fibrous tissue, behind, lined with mucous membrane. Of these B., one goes to each lung, the right being little more than an inch; the left, about two inches in length. On entering the substance of a lung, the B. divide into smaller branches, which again subdivide, until they are no larger in diameter than one-fiftieth to one-thirtieth of an inch, which give origin to, or terminate in, small polyhedral cells, which seem to cluster round their extremities, and open into them. These are the air-cells; they consist of elastic tissue, with a lining of mucous membrane, and beneath the latter, a layer of minute blood-vessels of the lung. See Respiration, Organs and Process of.

BRONCHI'TIS, or inflammation of the lining membrane of the bronchial tubes, is a disease of very common occurrence in Great Britain, and one of the greatest importance, for, if neglected, it not only destroys life, but if carelessly treated, may lead to premature and miserable old age. The first symptoms are generally those which distinguish a common cold—viz., shivering, headache, and sense of weariness, with occasional cough; but the cough continues, and recurs in paroxysms; there is a feeling of oppression on the chest, and the person *wheezes* when he breathes. He also breathes more rapidly, six or ten respirations in the minute more than he did when in health, and his pulse is quicker; and the ear applied to his chest, after these symptoms have continued for two or three days, will hear a rattling, as if air was bubbling through thickish fluid, which is the case; he is breathing through an extraordinary amount of mucus secreted by the inflamed lining membrane of the tube. During his paroxysms of cough, this mucus is spit up. If the inflammation extend no further, it is termed *tubular* B., and is seldom a fatal disease in the first attack; but, as may be expected, it will often extend, or, in some cases, begin in the small tubes—*vesicular* B.—when the symptoms just described will be present, but in a greater degree, the breathing being so embarrassed that the patient can no longer lie down, but requires to sit or stand up, and use all his muscles of respiration. Though he coughs, he spits very little, till about the third day, when he expectorates large quantities of yellow fluid. At last, prostration becomes so complete that he ceases to spit, and dies suffocated by the accumulated mucus, from the fifth to the seventh day. In less severe cases, or those which yield to treatment, the delicate tubes may be permanently injured by the inflammation. They may be thickened, which narrows their caliber; this will prevent the proper passage of the air, and gives rise to wheezing on any exertion, and cough, especially in winter. Moreover, after repeated attacks, one of the tubes may be blocked up entirely, so that the portion of lung to which it ought to conduct air, is no longer filled, and consequently collapses and wastes. This compels the adjacent tubes and air-cells to dilate to receive more air at the expense of their elasticity (emphysema, q.v.); the air cells may even burst, and so by degrees the apparatus for aërating the blood becomes less and less perfect. The treatment of B. must vary with the patient's constitution; but in most cases, counter-irritation, applied through the medium of mustard or hot turpentine fomentations, will be found very useful. These remedies act more rapidly than a blister, and may be frequently repeated. It should be remembered that patients suffering from B. are very easily depressed. Such medicines as ammonia should be given, to promote expectoration, combined with the liquor ammoniæ acetatis, to produce perspiration. In very acute cases, after a brisk purge, salines, with ipecacuanha or squills, may be given, and an emetic will remove accumulations of mucus.

In the B. of old persons, chloric ether will be found very useful, and may be combined with sedatives, as henbane; but opium must be given with great caution, or not at all, as it tends to increase the congestion of the inflamed tubes. The paregoric elixir (compound tincture of camphor) is an old and popular remedy in B., but enough has been said to impress on the reader the danger of tampering with bronchitis. In every case where it is possible, a skilled medical man should be employed, to determine, by the stethoscope, not only the disease but its exact situation; and as it is but too likely to recur at some future period, or symptoms caused by it to appear, a skilled opinion has a permanent value to the patient. See Catarrh.

BRÖNDSTED, Peter Oluf, a learned antiquary, born near Horsens in Jütland, Nov. 17, 1780. On completing his course of studies at the university of Copenhagen, he, in 1806, went to Paris, where he remained two years. He afterwards visited Italy and Greece, where he made excavations which furnished valuable materials for the study of classical antiquity. He died rector of the Copenhagen university in 1842. B.'s principal work is *Travels and Researches in Greece* (2 vols., Paris, 1826). In addition to several smaller archæological papers, amongst which was one in English, entitled *An Account of some Greek Vases found near Vulci* (Lond. 1832), and another on the bronzes of Siris, which appeared at Copenhagen, 1837, B. also wrote some valuable contributions to Danish history from mediæval Norman manuscripts (2 vols., Copenh. 1817–18), and *Memoirs of Greece during the Years* 1827 *and* 1828 (Paris, 1835).

BRÖNDSTED, or Brönsted, Peter Oluf, 1781–1842; an archæologist, b. in Jütland. He was educated in the university of Copenhagen, and with his friend Koes joined baron Stackelberg's expedition to Greece, where they made important antiquarian researches, and B. as a reward for his share was made professor of Greek in the university of Copenhagen. This professorship he exchanged for the office of Danish envoy at Rome. In 1832, after visiting France, England, Sicily, and the Ionian islands, he returned to Copenhagen and was made director of the royal museum of antiquities and professor of archæology and philology, and ten years later was appointed rector of the university. His death was in consequence of falling from his horse. His principal work was *Travels and Archæological Researches in Greece.*

BRONGNIART, Alexandre, an eminent French chemist and naturalist, born at Paris in 1770, is said to have delivered a lecture on chemistry before he was 15. In 1790, he visited England for a scientific examination of the Derbyshire mines and pottery-works, and, on his return to France, published a *Mémoire sur l'Art de l'Emailleur.* Appointed in 1800 director of the porcelain manufactory at Sèvres, he held that office for the remainder of his life, and revived the almost lost art of painting on glass. In his *Essai d'une Classification des Reptiles*, 1805, he established the four divisions of reptiles, and first gave them the names of *saurians, batrachians, chelonians*, and *ophidians.* His *Traité Elémentaire de Minéralogie*, published in 1807, at the instance of the imperial university, became a text-book for lecturers. In 1814, appeared his *Mémoire sur les Corps Organisés Fossiles nommés Trilobites*, a name which, as well as a basis of classification for those singular *crustacea*, naturalists owe to Brongniart. In 1815, he was elected a member of the academy of sciences of the French institute; he was also a member of the royal and geological societies of London, and of other learned bodies. In 1845, appeared his *Traité des Arts Ceramiques.* He died 14th Oct., 1847.

BRONGNIART, Adolphe Theodore, son of the preceding, author of several botanical works held in high esteem, was born in 1801; in 1833 became professor of botany at the Jardin des Plantes, Paris, and in 1834 member of the academy of sciences. In 1852, he was elected a foreign member of the royal society of London. He died in 1876.

BRO'NI, a t. of northern Italy, in the province of Pavia, about 11 m. s.e. of the town of Pavia, in a beautiful situation at the foot of the Apennines. It has a singular old church, some portions of which date from the 10th century. In its vicinity is the castle of Broni, celebrated in history as the place where prince Eugene obtained a victory over the French in 1703. Pop. about 7000.

BRONN, Heinrich Georg, a German naturalist, was born at Ziegelhausen, Mar. 3, 1800, and educated at Heidelberg university, where he devoted himself to the science of forests and natural history. In 1828, he commenced at Heidelberg a course of lectures on the physical and industrial sciences, and in 1833 was nominated ordinary professor of the same. After Leuckhardt's departure from Freiberg, B. was appointed to the zoological lectureship. B. wrote several important scientific treatises. His first was *A System of Antediluvian Conchylia* (Heidelberg, 1824), which was followed by *A System of Antediluvian Zoophytes.* In 1824, he visited the southern countries of Europe; and in 1827, made a second journey to Italy. On his return, he published the results of his journey (2 vols., Heidelberg, 1825–30). In 1834 appeared his most important geological work—*Lethæa Geognostica;* in 1841–49, his *History of Nature;* and in 1850, his *Universal Zoology*, which was the first attempt to develop zoology in its entirety with reference to extinct organisms. B. died in 1862.

BRONNER, Johann Philipp, 1792–1865; a German authority on wines, their nature and production, on which he published more than a dozen treatises. In 1831, he established a school for teaching wine-culture; and in later years, under a commission from Baden, he traveled and investigated in all the grape-growing countries of the continent.

BRONTÉ, a t. in the province of Catania, Italy, situated at the western base of Mt. Etna, about 22 m. n.n.w. of the city of Catania. B. has manufactures of woolen and paper, and the district produces oil, almonds, wine, etc. But the town is celebrated chiefly for its connection with admiral lord Nelson, who was created duke of Bronté by the Neapolitan government in 1779, with an annual income of 6000 *oncie* (about £3750). Pop. '72, 14,589.

BRONTÉ, CHARLOTTE, one of the most distinguished of modern novelists, was born at Thornton, in the West Riding of Yorkshire, on the 21st of April, 1816. Her father, a clergyman of Irish descent, removed, with six young children and an invalid wife, from Thornton to Haworth, in the same county, in 1821. Soon after their arrival, Mrs. Brontë died, so that Charlotte, trying hard in after-life, could but dimly recall the remembrance of her mother. Her father, eccentric and solitary in his habits, and full of extravagant theories for making his children hardy and stoical, was ill fitted to replace a mother's love. When Charlotte was eight years old, she was sent with three of her sisters to Cowan's Bridge school, which, whether deservedly or not, had an unfortunate notoriety conferred upon it 25 years later in the pages of *Jane Eyre.* Her two eldest sisters falling dangerously ill, and dying a few days after their removal thence, and the low situation evidently disagreeing with Charlotte's health, she was sent home when little more than nine, and remained there, "the motherly friend and guardian of her younger sisters," till, in 1831, she was sent to Miss Wooler's school at Roe Head, where her remarkable talents were duly appreciated by her kind instructress, and friendships formed with some of her fellow-pupils that lasted throughout life. A few years later, she returned to Miss Wooler's school as teacher there, and also had some sorrowful experiences as governess in one or two families. It was with a view of better qualifying themselves for the task of teaching that Charlotte and her sister Emily went to Brussels in 1842, and took up their abode in a *pensionnat.* When Charlotte returned home in 1844, a new shadow darkened the gloomy Yorkshire parsonage. Her father's sight was declining fast, and her only brother was a source of continual anxiety. It now seemed plain that school-keeping could never be a resource, and the sisters turned their thoughts to literature. Their volume of poems was published in 1846; their names being veiled under those of Currer, Ellis, and Acton Bell, but it met with little or no attention. Charlotte's next venture was a prose tale, *The Professor,* and while it was passing slowly and heavily from publisher to publisher, *Jane Eyre* was making progress. In the Aug. of 1847, it was submitted to Messrs. Smith & Elder, and published by them two months later. It took the public by storm. It was felt that a fresh hand, making new harmonies, was thrown over the old instrument. Henceforward, Charlotte B. had a "twofold life, as author and woman." Over the latter the clouds closed thicker and thicker. Mr. Brontë had indeed recovered his sight; but the sister Charlotte so intensely loved, and whose genius she ever delighted to exalt above her own, Emily—the Ellis Bell of *Wuthering Heights*—died in 1848. Her only brother also died in the same year; and Anne, the youngest of the family, following in 1849, Charlotte was left alone with her aged father in that dreary deserted home among the graves. Nevertheless, her energy never flagged. *Shirley,* begun soon after the appearance of *Jane Eyre,* was published in the autumn of 1849; and *Villette,* written under the frequent pressure of bad health and low spirits, came out in 1852. In the spring of 1854, Charlotte B. was married to her father's curate, the Rev. A. Nicholls, who had long known and loved her. It is a relief to find that a little bright sunshine was permitted to the close of a hitherto clouded life. It was, however, but brief; for serious illness set in, and on the 31st of Mar., 1855, she died. A fragment of an unfinished novel appeared in the *Cornhill Magazine* for April, 1860. See Mrs. Gaskell's *Life of C. B.* (1857).

BRONZE is a reddish-yellow, fine-grained alloy of copper and tin, in variable proportions. It was early known, and what is usually spoken of as *brass* in regard to the ancient nations, was in reality bronze. The brass or B. referred to in the Bible was probably composed of copper and tin, though some translators consider it likely to have been copper alone. The examination of the most ancient coins and metallic ornaments and implements leaves no doubt as to the acquaintance of the ancients with B.; so much so, that in the antiquarian history of European nations, there is a distinct period styled the *bronze period* (see next art.). At the present time, B. is largely used for house and church bells, Chinese gongs, ordnance or cannon metal, and speculum or telescope metal. In the preparation of the various kinds of B., great care must be taken to keep the tin from being burned away or wasted. To obviate this, it is customary to use much old B., as worn-out cannon, etc., and when that is fused in the furnace, to add the new copper and tin. The best Cornish and Banca tin are employed for the better kinds of castings, especially where strength of alloy is required. For inferior work, old scrap tin, which often contains lead, is used; and where strength of material is not an object, a little zinc and lead are added. In either case, during the fusion of the mixed metals in the furnace, at a high temperature, as little air as possible must be admitted to the furnace, otherwise the metals are oxidized, and the alloy is deteriorated. B., when well made, is, excepting gold, platinum, and some of the rare metals, the most durable metallic material with which we are acquainted; and this, coupled with its extreme hardness, rendering it difficult for time and ordinary wear and tear to efface inscriptions or medallions stamped on it, has led the mint in France, some years ago, to issue a bronze coinage in place of copper; and for the last twelve or fifteen years bronze coinage has taken the place of a copper coinage in Great Britain.

The principal varieties of B. have the following average composition:

		Copper.	Tin.
	Brass ordnance or bronze cannon	9	1
	Bronze for toothed wheels	10	1
	" for mathematical instruments	12	1
	" for bearings of machinery	8	1
	Chinese gongs and cymbals	5	1
	Musical bells	6	1
	House bells	4	1
	Large bells	3	1
	Telescope or speculum metal	2	1
Ancient.	Mirrors	2	1
Ancient.	Hard bronze	7	1
Ancient.	Medium bronze	8	1
Ancient.	Soft bronze	9	1
Ancient.	Flexible bronze nails	20	1

Recently, B. has been deposited on small statues and other articles, in greater or less thickness, by the electrotype process (see GALVANISM), forming very pleasing ornaments at a cheaper rate than ordinary B. ornaments can be purchased for. The same process has been suggested for coating those parts of machinery which are liable to rust.

BRONZE, AGE OF (Dan. *Broncealderen*), a term used by many modern archæologists to distinguish the second of the three successive periods into which, as they hold, the primitive or pre-historic antiquities of a country may be divided. They take for granted that among a rude or savage people, stone, being more easily fashioned, would come into use before any kind of metal; and that of metals, copper, being oftener found ready for the hammer, would come into use before iron, which has generally to be smelted before it can be wrought. These assumptions—which, in so far, are only in accordance with what has actually been observed among uncivilized races—have obtained from a very early date. Lucretius, writing in the century before the Christian era, has recorded them with his usual vigorous precision:

> Arma antiqua, manus, ungues, dentesque fuerunt,
> Et lapides, et item sylvarum fragmini rami:
> Posterius ferri vis est ærisque reperta;
> Et prior æris erat quam ferri cognitus usus.
> *De Rerum Natura*, v. 1282.

> Man's earliest arms were fingers, teeth, and nails,
> And stones, and fragments from the branching woods;
> Then copper next; and last, as later traced,
> The tyrant iron.—*Mason Good's Translation.*

More than one antiquary of the last century appears to have suggested the distribution of archæological objects into eras of stone, of copper or bronze, and of iron. But the proposed classification received scarcely any attention until about forty years ago, when it was adopted and developed by Mr. C. J. Thomsen, superintendent of the ethnographical and archæological museum of Copenhagen, in his *Ledetraad tit Nordisk Oldkyndighed* (Kjöbenhavn, 1836), and by Mr. Nilsson, professor of zoology in the university of Lund, in Sweden, in his *Skandinaviska Nordens Urinvonare* (Lund, 1838–43). According to the theory of these writers—which is held by almost all archæologists in Denmark, Sweden, and Norway, by many in northern Germany and in Switzerland, and by a few in other parts of Europe—the first three stages in the progress of a nation from barbarism to civilization are as clearly identified and defined by their relics of stone, of bronze, and of iron, as the comparative antiquity of geological strata, or periods of the world's creation, is determined by the fossils which they are found to contain.

The name of the "age of stone" is given to the period when weapons and implements were made of stone, amber, wood, bone, horn, or some such easily wrought material, and during which very little or nothing was known of metals. During this era, the people, few in number, and savage in their habits, clothed themselves chiefly with skins of animals. They buried their dead in large sepulchral chambers, covered by what have been called *cromlechs*, or girdled round by the unhewn stone pillars called "Druidical circles." The bodies have most frequently been found unburned, and often with rude urns beside them.

During the "age of bronze," weapons and implements were made of copper or of bronze, and iron and silver were little or not at all known. The dead were burned, and their ashes kept in urns, or deposited in stone-chests, which were covered by conical mounds of earth or heaps of loose stones. In the urns, articles of gold and amber are found, but never of silver. Most articles of metal appear to have been cast; where marks of the hammer appear, it is contended that the forging or beating must have been done by a stone hammer upon a stone anvil.

The "age of iron" is the name applied to the third and last of the three supposed periods. During this era, it is conceived that iron displaced bronze in the manufacture of weapons and implements, and that silver and glass came into use. The dead were still occasionally burned; but they were frequently buried without burning, often seated on chairs, and, at times, with a horse in full war-harness laid beside the body of his master.

The Scandinavian and German antiquaries admit that their three periods run, more or less, one into another; that stone weapons continued to be used throughout the age of B.; that B. and gold were not unknown in the age of stone; and that weapons of stone and B. continued to be used in the age of iron. This admission obviously detracts very much from the practical value of the classification for chronological or other scientific purposes. But the late Mr. J. M. Kemble, and other British antiquaries, have taken objections to the classification altogether, as irreconcilable with generally admitted facts, when carried out to its strict and necessary consequences. They point to the every-day discovery of objects of stone, B., and iron, in the same ancient urns, graves, and dwellings. They instance the case of the Huns, who had swords of iron, while they pointed their arrows with bones; the case of the Anglo-Saxons, who fought with stone mauls at Hastings; and the case of the Germans, who used stone hammers in the thirty years' war. They show stone weapons, in some of which the traces of metal are still fresh, while others attest for themselves that they could not have been cut but by a thin sharp metal point.* They prove from Greek and Roman writers that the nations of the n. and w. of Europe used iron weapons during what must have been their B. age. And they repudiate the proposed appropriation of different modes of burial to the different ages—a point on which the supporters of the theory appear to be hopelessly divided among themselves—on the ground that graves assigned to the B. period have been found to contain more iron than B., and that other supposed characteristics of sepulchers of the B. age are quite as common in sepulchers of the iron age. But although the threefold classification of the Scandinavian and German archæologists cannot be relied upon for historical uses, it may be accepted as a very convenient mode of arranging archæological objects. It has been adopted, with some modifications, in the gallery of British antiquities in the British museum at London, in the national museum of the antiquaries of Scotland at Edinburgh, in the museum of the royal Irish academy at Dublin, and in other collections, where the articles are classed, for the most part, according to the materials of which they are made.

BRONZE-WING, Bronze-winged Pigeon, and Bronze Pigeon, names given in the Australian colonies to certain species of pigeon (see Pigeon and Columbidæ), chiefly of the genus *peristera* of Swainson, on account of the lustrous bronze color with which their wings are variously marked. They are otherwise also birds of beautiful plumage.—The Common B. or bronze-winged ground dove (*columba* or *peristera chalcoptera*) is distributed over all the Australian colonies. It is often seen in flocks, feeds on the ground, and builds its nest chiefly on low branches of trees growing on meadow-lands or near water. It is a plump bird, often weighing fully a pound, and is acceptable at every table.—The Brush B. or little bronze pigeon (*C.* or *P. elegans*) is not so plentiful nor so widely distributed, chiefly inhabiting Tasmania and the southern parts of Australia. It inhabits low swampy grounds, never perches on trees, resembles a partridge in its habits, and makes a loud burring noise like a partridge when it takes wing on being alarmed.—The Harlequin B. (*C.* or *P. histrionica*) is found in the n.w. parts of New South Wales in great flocks, feeding on seeds.—Some of the species of *geophaps*, another of the genera or sub-genera of the *columbidæ*, are also sometimes called bronze-wing. Their partridge-like appearance and habits have gained for them the name of partridge pigeon (q.v).

BRONZING is the process of covering plaster or clay figures, and articles in ivory, metal, and wood, so as to communicate to them the appearance of ordinary bronze. Several of the materials employed are of little value, whilst others are expensive. Thus, *gold powder* is used for the finer work, and is prepared by grinding gold-leaf with honey on a stone slab till a very fine state of division is attained, then washing out the honey, and drying the gold powder. Inferior gold-leaf, or that which contains much silver and copper, yields the *German gold powder* employed in bronzing. *Copper powder* is prepared by introducing an iron bar or plate into a solution of copper, when the latter metal is precipitated as a finely-divided red powder. *Mosaic gold*, or *musivum*, is made by fusing 1 lb. of tin, introducing ½ lb. mercury, allowing the alloy or amalgam to cool, then pulverizing and grinding up with ½ lb. sal-ammoniac, and 7 ozs. sublimed sulphur. Ultimately, the whole is subjected to the process of sublimation, when the tin, as a brilliant yellow powder, resembling gold, is left in the subliming vessel. The color of mosaic gold may be deepened by the addition of red oxide of lead, and it then assumes a copper tint. *Gold size* is prepared by heating 1 lb. of linseed oil, and gradually adding 4 ozs. of gum animi in very fine powder. When boiled sufficiently, it assumes the consistence of tar, and may then be strained through cloth. When employed in bronzing, some vermilion is added, to make it opaque, and turpentine,

* M. Frederic Troyon, of Lausanne, one of the Swiss antiquaries who accept the three periods of their Scandinavian brethren, instances certain stone axes (now in the collection of baron Renberg, at Prague), which were found, along with their cores, at the site of a primitive manufactory of these weapons in Bohemia. "These cores," he says, "when replaced in the holes from which they had been taken (easily verified by the corresponding veins of the stone), left so little play-room, that it was evident they could only have been detached by a metal point, and not by a hollow cylinder, which could not have given to the hole its conical form, now quite apparent. Instead of the soft iron which is employed nowadays in such operations, the ancients used copper or bronze; and, of course, water and silicious sand were likewise employed in the process."

to make it thin and limpid enough to be easily laid on the plaster cast or other article with a brush, and the object may ultimately be rubbed over with soft chamois leather, which is occasionally dipped into the gold size. The other B. powders are best laid on with a solution of gum-arabic or isinglass, either of which acts as a cement.

Gun-barrels are bronzed by acting upon them with the chloride or butter of antimony (*bronzing* salt), or with hydrochloric or nitric acids, when the surface of the iron gets partially eaten into, and covered with a thin film of oxide; after which the gun-barrel is thoroughly cleaned, oiled, and burnished. A brownish shade is thus communicated to the barrel, which protects it from rust, and at the same time renders it less conspicuous to an enemy or to game. In the bronzing operation known as the Damascus, the barrel is treated with dilute nitric acid and vinegar, to which sulphate of copper has been added. The result is, that metallic copper is deposited irregularly over the iron surface; and when the latter is washed, oiled, and well rubbed with a hard brush, a very pretty appearance is communicated to the barrel. Articles in wood that require to be bronzed, are first coated with a mixture of size and lampblack, and dried, and then a bronze powder, consisting of very finely-divided patent yellow, raw umber, pipe-clay, lampblack, and Prussian blue, is put on with a brush. After being dried again, the article is burnished with cloth or leather, covered with a layer of Castile soap, and, lastly, cleaned up with a woolen cloth. Copper vessels, coins, etc., are bronzed by heating them in a copper boiler containing vinegar, with 2 parts of verdigris, 1 of sal-ammoniac dissolved in it, when, after sufficient boiling, a pleasant reddish-brown hue is imparted. Bronze and copper articles may have an antique appearance communicated by applying a solution of sal-ammoniac 1 part, cream of tartar 3, common salt 6, hot water 12, and more or less nitrate of copper, when an ancient greenish hue is obtained.

BROOCH (from a root signifying to pierce; comp. Eng. *to broach;* Fr. *brocher,* to spit, or to stitch; Wel. *broc,* to stab), an ornamental pin or instrument for fastening the dress, consisting for the most part either of a ring or disck or of a semicircle, there being a pin in either case passing across it, fastened at one end with a joint, and at the other with a hook. Brooches were much used in antiquity, and varied in form as much as in modern times. They were worn both by men and women, and with a view both to ornament and use, from the time of Homer to the fall of the western empire. Nay, in the early portion of the middle ages, and even amongst semi-barbarous tribes, the art of making *fibulæ* seems not only to have flourished, but to have attained marvellous perfection. Many of those found, both in Ireland and in Scotland, are wonderfully beautiful in workmanship, and still more so in design; and it is doubtful whether antiquity has left us anything in the way of personal ornament more perfect than the so-called Hunterston B. It was found in 1830, on the estate of Hunterston, in the parish of w. Kilbride, Ayrshire, near to the scene of a conflict which preceded the battle of Largs, in 1262. It is of silver, richly wrought with gold filigree, and elaborately chased with lacertine and ribbon patterns. It is set with ornaments of amber; diameter, $4\frac{9}{10}$ inches. On the reverse are runes, which have been variously read. Dr. Wilson says, "what is decipherable reads in good Scottish Celtic into what he explains to mean—Malbritha, his friend, in recompense to Maolfridi."—*Prehistoric Annals.* One of the most famous articles of the kind existing in Scotland is the *Brooch of Lorn*, in the possession of Macdougal of Dunolly, near Oban. It is believed to be identical with one torn from the breast of Robert Bruce by Alexander of Lorn, the ancestor of Macdougal, in a personal contest with the king. This interesting article is of silver, about 4 in. in diameter, with a circle of jeweled obelisks.

BROOKE, a co. in West Virginia, in the "Panhandle"—a narrow strip between Ohio and Pennsylvania; 75 sq.m.; pop. '80, 6013. Surface hilly, soil fertile; productions agricultural. The Pittsburg, Cincinnati and St. Louis railroad passes through it. Co. seat, Wellsbury.

BROOKE, Francis J., 1763–1827; a Virginian, an officer in the revolutionary army, speaker of the Virginia senate, and presiding judge of the court of appeals.

BROOKE, Henry, dramatist and novelist, was born in 1708, in the house of Rantavan, co. Cavan, Ireland. His father was a wealthy clergyman. Young B. was first sent to school to one Felix Somerford, where he so distinguished himself that his tutor, in the fullness of his heart, prophesied that he would play a great part in life. His talent for rhyming first made itself evident here, and it received further development while he resided at Dr. Sheridan's school in Dublin. In 1724, he went to study law in London, and became the chosen friend of Pope and Lyttleton. From the heart of this brilliant literary society he was recalled to Ireland by a dying aunt, who left him guardian of her child, a girl of twelve. B. put the child to a Dublin boarding-school, and married her secretly two years thereafter. Four or five years subsequently, when his wife had borne him three children, he removed to London, and once more became a bright particular star in the galaxy of metropolitan genius. In London, he published a poem, entitled *Universal Beauty*, which Pope admired, and of which he perhaps turned a couplet here and there. Shortly after, B. returned to Ireland; but in 1736, he was again in

London, and was introduced to the prince of Wales, who cultivated his friendship, and made him presents of books and china. About this time, he published his play, entitled *Gustavus Vasa*, full of the noblest sentiments, and the most inconceivable characters. In 1740, B. was taken ill, and returned to his native country, where he published several books, and a tragedy, *The Earl of Westmoreland*, which was performed in Dublin. In his later years he removed to Dublin, and died there in 1783. The sonorous eloquence of his plays has not saved them from oblivion; and his novel, entitled *The Fool of Quality*, is the only work of his which is likely to meet the eyes of modern readers. It was originally published in five volumes, and was greatly admired by John Wesley. A new edition was published in 1859, with a preface by the Rev. C. Kingsley.

BROOKE, Sir JAMES, rajah of Sarawak, and governor of Labuan—a man strongly imbued with the spirit of the old adventurers of the Elizabethan time—was b. at Coombe Grove, near Bath, 29th April, 1803. He early entered the East India army, was seriously wounded in the Burmese war, and returning home on furlough, spent some time in travel on the continent. Shipwrecked on the voyage out to join his regiment, he was unable to reach India before his furlough had expired; his appointments consequently lapsed, and he quitted the service. He now conceived the idea of putting down piracy in the Eastern archipelago, and of carrying civilization to the savages inhabiting these islands. He purchased a yacht, which he manned with about 20 sailors, and after a three years' cruise in the Mediterranean, to test the sea-worthiness of his vessel and the seamanship of his crew, sailed from London for Sarawak, a province on the n.w. coast of Borneo, Oct., 1838. When he arrived there, Muda Hassim, the uncle of the sultan of Borneo, was engaged in a war with some rebel tribes. B. lent his assistance, and in return had the title of rajah and governor of Sarawak conferred upon him, the native governor being forced to resign. B. immediately set about reforming the government, instituted free trade, and framed a new code of laws. The murderous custom of head-hunting, prevalent among the Dyaks, he declared to be a crime punishable with death, and vigorously set about the extirpation of piracy. This was done so draconically as to occasion great dissatisfaction in this country; and the result was, that parliament abolished the "head-money" that had been previously paid for the slaughter of pirates. Certain charges, however, brought against B. in the house of commons, in connection with this matter, were declared by a royal commission to be unsubstantiated. The head-money was received, not by B. and his associates, but by the British ships-of-war that had co-operated with him. On his return to England, B. received a warm welcome, was created a knight commander of the Bath in the year following; and the island of Labuan, near Sarawak, having been purchased by the British government, he was appointed governor and commander-in-chief, with a salary of £2000 a year. In 1857, B., who had been superseded in the governorship of Labuan, but who still acted as rajah of Sarawak for the sultan of Borneo, was attacked at night in his house by a large body of Chinese, who were irritated at his efforts to prevent opium-smuggling, and only escaped with his life by swimming across the creek. The Chinese committed great havoc on his property, but their triumph was short-lived. B. collected some natives, attacked the Chinese, defeated them in several successive fights, and ultimately forced them into the jungle, where they must have perished of starvation. Upwards of 2000 Chinese were killed, and all their flourishing settlements destroyed. Returning to England soon after this, B. lectured in several of the chief towns on the advantages likely to result to this country from a possession of Sarawak, and urged the desirableness of the British government taking it under its protection, as otherwise it was likely to fall into the hands of the Dutch. To enforce this view, an influential deputation waited upon the earl of Derby (then head of the government) in Nov., 1858, but he declined to entertain it. He returned to Borneo in 1861, but visited England again twice before his death, on the second occasion having the satisfaction of seeing the independence of Sarawak recognized by the English government. The town prospered greatly under his regime; he found it a place of some 1000 inhabitants, he left it a town of 25,000; and the exports to Singapore, which, in 1840, amounted to £25,000, were in 1858, £300,000. B. died in 1868; a biography appeared in 1877.

BROOKE, STOPFORD AUGUSTUS. See page 879.

BROOK FARM ASSOCIATION OF EDUCATION AND AGRICULTURE. See page 879.

BROOKINGS, a co. in s.e. Dakota, on the border of Minnesota and Big Sioux river 750 sq.m.: pop. '80, 4965, of whom 145 were Indians. There are several large streams and many lakes in the territory.

BROOKITE, a mineral of pure native titanic anhydride. It is found in Perthshire, Scotland. A kind found in the Ozark mountains is known as *arkansite*.

BROOKLAND, Va. See page 879.

BROOKLIME, *Veronica Beccabunga*, a species of speedwell (q.v.) abundant in ditches, water-courses, and wet places near springs in Britain, common also in most parts of the continent of Europe. It is a perennial plant, with procumbent stems, rooting at the base; leaves on short stalks, elliptical, obtuse, and slightly serrate, both stems and leaves smooth and very succulent; the small blue flowers, in form resembling those of the other Speedwells, in racemes, the stalks of which arise from the axils of the opposite leaves. The leaves and young shoots have a bland or slightly bitter taste, and are a tolerable ingredient in spring salads. They are sometimes sold along with water-cresses. See CRESS, WATER.—In Scotland, the plant is called *Water Purpie*.

BROOKLIME, a European plant growing in wet places, used in salads in England and sometimes sold with water-cresses. There is a similar plant in the United States bearing the same name.

BROOKLINE, a village and township in Norfolk co., Mass., on the Charles river, s.w. of Boston, and on the Boston, Hartford and Erie, and the Boston and Albany railroads. B. is a favorite place of residence for persons doing business in Boston, and a part of the town was annexed to that city in 1870. There is a fine town-house, a good public library, and some notably beautiful churches. Communication with Boston is made also by horse railroads. Pop. '80, 8053.

BROOKLYN, a city at the w. end of Long Island, in the United States, belonging to New York state, in lat. 40° 42′ n., 73° 59′ west. It stands at the s.w. extremity of Long Island sound, which is here appropriately known as East river, partly in allusion to the narrowness of its channel and the rapidity of its tide, and partly in contradistinction to North river as a second name of the Hudson. Between B. and New York there are numerous ferries of about three-quarters of a m. in width, on which ply steam-boats every few minutes by day, and every half-hour by night. B. is connected with New York by a suspension bridge nearly half a m. long and 125 ft. above the water. In 1850, the pop. was 96,838; in 1870, 396,099; and in 1875, 482,687. B. was founded by the Dutch in 1625, and in 1776 its neighborhood was one of the principal seats of the revolutionary war. Occupying comparatively elevated ground, B. commands a complete view of the adjacent waters and their shores, while, notwithstanding its inequalities of surface, it consists chiefly of straight streets, crossing each other at right angles. It is divided into wards, and governed by a mayor and a board of aldermen. B. has a very large number of churches (whence it is often called the "city of churches"), several flourishing banks, various literary institutions, and numerous seminaries of education—an ample share, in short, of all that characterizes a wealthy, populous, and intelligent community. It has an immense trade in grain, the warehouses being capable of holding about 12,000,000 bushels. It possesses also a national navy-yard, which embraces 45 acres of land, and magnificent docks, including a wet-dock for the largest vessels, the most extensive in the union.

BROOKLYN (*ante*), the capital of Kings co., N. Y., with 566,663 inhabitants; comprising, under the act of consolidation which went into effect Jan. 1, 1855, Brooklyn, Williamsburg, Green Point, Wallabout, Bedford, New Brooklyn, Bushwick, Gowanus, and South Brooklyn; situated in the northern part of Long island, embracing an area of 16,000 acres, or 25 sq. miles. The city is 8 m. long, with a breadth from 2 to 5 m., averaging 3½ m.; it has a water-front on the East river and bay of New York, 8½ m. in length; is bounded on the n. by Newtown creek; on the s. by the towns of New Lots, Flatbush, and New Utrecht; on the e. by the Queens co. line; and on the w. by the East river and bay of New York. The s. and e. borders are occupied by a broad range of low hills extending into Queens county. Along the shore opposite the lower point of New York, is an irregular bluff known as the "Brooklyn Heights," on which are many handsome residences; it has a very picturesque appearance, especially when viewed from New York, while the rays of the setting sun fall upon the houses. A large portion of the southern part of the city is low and level. Its water-front is entirely occupied by wharves and warehouses. Williamsburg, now called Brooklyn, E. D. (eastern district), includes the thickly-settled portions n. of the Wallabout bay, contains a large number of manufacturing establishments, and has its entire water-front devoted to commercial purposes. Greenpoint lies between Bushwick and Newtown creeks, and occupies the extreme northwestern part of the city; it contains large ship-yards and manufactories. South B., lying s. of Atlantic street, has an extensive water-front, and contains large wood, coal, stone, and lumber-yards, numerous planing-mills, distilleries, breweries, plaster mills, foundries, and machine-shops. B. is connected with New York by 13 steam ferries, and the Annex boats leave the foot of Fulton street every 20 minutes for Jersey City and Hoboken. With the remoter part of Long island it is connected by the Long Island and the South Side railroads, and with Coney island, a popular seaside resort, at the s.w. extremity, by a number of steam-car lines during the summer season, while some 26 lines of city railroads, using horse-power, radiate from the ferries to the bounds of the city in every direction. An elevated railroad, on the plan of those erected recently in New York was opened for traffic May 13, 1885. It extends from Fulton ferry to East New York, a post village of New Lots township, on the Long Island railroad; a distance of 5½ miles. The East river bridge, connecting B. with New York, is described under the article BRIDGES. The estimated cost of the bridge was $7,000,000, of which one third was to be furnished by New York and two thirds by Brooklyn, but the actual cost amounted to nearly $15,000,000. B. is well supplied with pure, soft water, derived from Hempstead hook, Valley and Springfield creeks; is thoroughly lighted by gas companies; has a large and efficient fire department; and its sanitary and police matters are cared for by the metropolitan boards of health, of excise, and of police, respectively. The total number of deaths registered by the board of health in the 12 months ending Nov. 30, 1882, was 15,013, representing an annual death rate of 24.84 in a thousand. 14 street car lines carried 87,714,834 passengers; 7379 steamers and other vessels touched at the wharves; the number of buildings completed was 1840, and 660 were in course of

erection. The assessed valuation of taxable property for 1883 was $304,500,000, and the annual tax levy, $7,786,522, making the average rate of taxation $2.52. The city debt was $37,493,723. The city government consists of a mayor, controller, auditor, treasurer, corporation counsel, tax collector, registrar of arrears, 3 commissioners of city works, 3 commissioners of police and excise, 3 commissioners of fire and buildings, and a board of health; and each of the 25 wards is represented in the board of aldermen. The report of the board of education shows that during the school year ending Sept. 30, 1881, the number of licensed teachers employed in the public schools was 1289, the majority women. The whole number of children of school age who attended the 58 public free schools of the city was 96,077. There were 305 private schools.

B. has a number of parks: Washington park occupies the site of Fort Greene, of revolutionary fame; Carroll park is very tastefully laid out; but its chief pleasure-ground, and one of the most superb in the country, is Prospect park, the construction of which was begun in 1866; it now covers, with the adjoining parade-ground, 550 acres. The site is one full of natural beauty; magnificent views, fine forest trees, a fertile soil, and numerous lakes lend to the spot all the charms of rural scenery. Upon the plaza at the main entrance is a magnificent fountain and a bronze statute of Abraham Lincoln. Twenty-five acres have been set apart for zoological gardens, and there is a fine observatory on Lookout hill. There are 11 m. of walks, and 10 m. of roads for driving and riding purposes. The cemeteries of B. are widely known: Greenwood, Cypress Hills, and the Cemetery of the Evergreens, are the principal, while there are several of smaller size and note. In Greenwood are interred about 225,000 bodies, and there are over 2000 monuments; the ground inclosed is 413 acres, situated on Gowanus heights, in the s. part of the city.

The U. S. government bought the site now occupied by the navy-yard, for $40,000, in 1801, but by subsequent purchases has become the owner of about 200 acres in the neighborhood. The navy-yard occupies nearly 50 acres, inclosed by a high brick wall, and is situated on the s. shore of Wallabout bay. The Directory credits B. with 276 churches, which would seem to justify the appellation of "the city of churches." Of this number there are: Baptist, 32; Congregationalist, 21; Presbyterian, 27; Protestant Episcopal, 36; Reformed church, 16; Lutheran, 14; Methodist Episcopal, 53; besides 7 churches for colored members; Roman Catholic, 44; and the Jews have 6 synagogues. We are limited to a simple reference to a few of the more prominent churches. "St. Ann's on the Heights" is a fine Episcopal church; the general style of its architecture is the middle-pointed gothic. The church of the Holy Trinity is built of brown stone, in the Gothic style, and has a spire 275 ft. high; it is one of the handsomest churches in the country. St. Paul's is constructed of rough-hewn blue granite and sandstone, in Gothic style; it has a front of 75 ft., a depth of 145 ft., and is 67 ft. high in the nave. The church of the Pilgrims is built of gray stone, and inserted in the main tower is a piece of the Plymouth rock; its pastor, Dr. R. S. Storrs, is a noted pulpit orator. Plymouth church, a plain brick building on Orange street, has accommodations for seating 2800 persons, and contains what was until recently the largest church organ in America; Henry Ward Beecher has been its pastor for the last 33 years, and the desire to hear him preach is so great that many pew-holders generously give up their seats to strangers for the evening service. The amount offered for pew-rents during the year 1880 was over $40,000. A Roman Catholic cathedral is in process of erection on Lafayette avenue, between Carlton and Vanderbilt avenues; it will be a very large and imposing structure. The "Tabernacle" is on Schermerhorn street; the exterior is of brick, with stone trimmings, and the interior is well arranged for seating a large audience; the plan is a large semicircle, the organ in the center of the straight side, with the pulpit immediately in front, giving the speaker command of the entire building; a spacious gallery runs around the entire auditorium. A door at the end of each aisle opens into a wide hall, so that in case of fire the church can be emptied in a very short time; its pastor is the well-known Rev. T. De Witt Talmage. There are over 300 private schools and educational institutions in B. Among these are several whose names have now a national reputation. Such are the Packer collegiate institute, and the Brooklyn heights seminary for young ladies; the Adelphi academy, the Collegiate and Polytechnic institute for boys, and the juvenile high-school. Among the principal buildings are the city hall, the Kings co. court-house, costing, with the adjacent grounds, $1,200,000; the Kings co. savings-bank, the church charity foundation, the new B. orphan asylum, the college of St. John the Baptist, the art building, the academy of design, and the Long Island historical society, now being built of terra-cotta, at the corner of Clinton and Pierpont streets. The academy of music, on Montague street, was built in 1860, costing $206,000; it contains seats for 2300 persons; is built of handsome brick with Dorchester stone trimmings; 232 ft. long, 92 ft. wide, and 56 ft. high. Opposite is the B. library, a handsome model of what the home of a library ought to be. The building was completed in 1867, at a cost of $227,000; the library now numbers 67,000 volumes, and Mr. S. B. Noyes, the efficient librarian (d. 1885), has the credit of organizing a catalogue system that has been highly praised for its thorough and convenient method of reference. The Kings co. penitentiary is on Nostrand avenue; its expenses for 1879 were $101,171.75; its earnings, $92,917.04; and it contained 2000 prisoners. The two principal theaters are the Park theater, on Fulton street, opposite the city hall park, and

the Brooklyn theater, corner of Johnson and Washington streets, on the site of one which was destroyed by fire Dec. 6, 1876, causing the death of over 300 persons; the new structure has proper means of exit, and is called Haverly's Brooklyn theater. There are 21 hospitals, dispensaries, and infirmaries, besides numerous other benevolent institutions. Among these are the Long Island college hospital, St. Mary's and St. Peter's hospital, the female orphan asylum, the marine hospital, and the Graham institution for the relief of aged women.

B. is the headquarters of the 2d division of the national guard of the state of New York, consisting of the 5th and the 11th brigades; this force consists of the 13th, 14th, 23d, 32d, and 47th regiments of infantry, 3 troops of cavalry, and 3 batteries of artillery.

The streets, with the exception of Fulton street, the principal thoroughfare, are generally straight, have a width of from 60 to 100 ft., and cross each other at right angles. Myrtle and Atlantic avenues are, next to Fulton st., the most active business thoroughfares, and contain many stores that carry on a large trade. The large number of persons who reside in B. and do business in New York has caused the city to be termed facetiously a "big bedroom;" in fact, although its own industrial and commercial activity is very great, by far the larger part of the city is devoted to private dwelling-houses. Clinton avenue is beautifully laid out with handsome residences surrounded by ornamental grounds, and it would be difficult to find in any city a street more attractive of its kind. From a point between the Catherine and Fulton ferry slips to the Gowanus district extends along the entire river front an almost unbroken line of storehouses. The Atlantic dock warehouses of South Brooklyn opposite Governor's island cover a space of 20 acres, and inclose a basin 40 acres in area. Here most of the grain brought from the west is handled, stored, and transhipped. The capacity of the grain warehouses is estimated at 12,000,000 bushels; and about 25,000 vessels, exclusive of canal boats and lighters, are said to be annually unloaded. The principal articles are molasses, sugar, grain, coffee, oil, hides, and wool. The annual storage of merchandise in B. is valued at $261,000,000. Among the numerous manufacturing establishments of B. are the following: Prentice's hat factories; the Brooklyn brass and copper company; the New York agricultural works; the American steel company's works; the printing house and book manufactory of D. Appleton & Co.; the great sugar-refineries of the eastern district; Peter Cooper's glue factory; Kalbfleisch's chemical works, etc.

The first settlement of Brooklyn, formerly Breuckelen, dates from 1636, when a few Walloon colonists took up their residence on the spot that still bears the name of Wallabout. English and Dutch settlers followed; and in 1667, a patent or charter was granted to the town by governor Richard Nicholls. The first church had been erected the previous year. In 1698, the population amounted to only 509 persons, of whom 65 were slaves. In 1776, the site of the present town was the scene of the battle between the Americans and the British, usually known as the battle of Long island. In 1816, Brooklyn was incorporated as a village, and in 1834 it became a chartered city. Williamsburg attained the rank of a village in 1827, and was recognized as a city in 1851. The population of B. was in 1800, 3298; in 1820, 7175; in 1830, 15,292; in 1840, 36,233; and in 1850, 96,850. In 1860, after its consolidation with Williamsburg, the population had increased to 266,661; in 1870, to 396,099; in 1875, to 482,493; and according to the U. S. census of 1880, B. had 566,689 inhabitants.

BROOKLYN, Cal. See page 879.

BROOKS, a co. in s. Georgia bordering Florida; 550 sq.m.; pop. '80, 11,727—6057 colored. The Atlantic and Gulf railroad intersects. Productions, cotton, corn, etc. Co. seat, Quitman.

BROOKS, Charles Shirley, novelist and journalist, was the son of Mr. William Brooks, an architect, and was b. at Brill, in Oxfordshire, about the year 1820. B was educated chiefly by the late Rev. T. J. Bennett, canon of St. Paul's; and upon leaving school, was articled to an attorney. Upon serving out his time, he passed with distinction the examination in the law society's hall. Literature, however, had more charms for him than the law, and he had not long been settled in London, before he tried the experiment of living by it as a profession. He wrote dramas—*Our New Governess; Honors and Tricks; The Creole; The Daughter of the Stars;* and he contributed at the same time to some of the leading periodicals and journals. An introduction to the editor of the *Morning Chronicle* procured him a steady engagement as writer of the parliamentary summary for that journal. He was also sent by the proprietors of the *Chronicle* on a mission into Russia, Syria, and Egypt, to report on the condition of labor and the poor in those countries; and the results of his observations appeared in a series of letters in that journal. B. was also a contributor to *Punch* from the commencement of that periodical. The "Essence of Parliament" in *Punch* is said to have been regularly contributed by him. He alse wrote for it "Miss Violet and her Offers;" "The Neggletons," etc. B. also contributed political and other articles to the columns of the *Illustrated London News.* As a novelist, B. is a graceful and pleasing writer, and therefore deservedly popular. He is author of *Aspen Court; The Gordian Knot; The Silver Cord* (originally published in *Once a Week*); and *Sooner or Later.* B. is likewise author of *The Russians of the South.* He acquired a reputation as a lecturer. On the death of

Mr. Mark Lemon, in 1870, B. became the editor of *Punch*. He died in 1874. A volume of his *Wit and Humor* appeared in 1875.

BROOKS, Charles Timothy, b. Mass., 1813; graduated from Harvard, and in 1837 settled in Newport as a Unitarian minister. Most of his time was devoted to literature, especially to German translations. He published Schiller's *William Tell; Homage to the Arts; German Lyrics; Songs of the Field and the Flood;* a translation of Goethe's *Faust;* and many less important works; besides a volume of sermons, various poems, and a prose romance. He d. 1883.

BROOKS, Erastus, brother of James, b. Maine, 1815; graduated at Brown university, and became teacher of a grammar school and editor of the *Haverhill Gazette*. In 1836, he was a Washington correspondent for several papers, and soon after became associated with James in the New York *Express*, where he remained as assistant and as chief editor until about 1877. He was a leader in the American party, and their candidate for governor of New York (but not elected) in 1856. He was in the state senate of 1856, where his advocacy of the bill to divest Roman Catholic bishops of their title to church property involved him in a controversy with bishop Hughes, which at the time attracted much attention. Mr. B. has been for several terms in the legislature.

BROOKS, James, 1810–73; b. Maine; a journalist and politician. He graduated at Waterville college, and was principal of a Latin school in Portland; became a writer of letters to various newspapers, and originated the idea of regular correspondence from Washington. As a member of the Maine legislature in 1835, he proposed a survey for a railroad from Portland to Quebec or Montreal. In that year he made a tour of Europe on foot, sending his observations to the *Portland Advertiser*. In 1836, he established the *New York Express*, published both morning and evening, which still survives as a prominent evening newspaper. In 1847, he was a member of the state legislature, and in 1848 was elected to congress. During the native-American excitement, 1841–44, his paper was strongly in favor of that party. In 1850, he favored the compromise measures of Henry Clay, and after the outbreak of the civil war he left the party with which he had been so long identified, and was immediately returned to congress by the democrats. In 1871, after a rapid trip abroad, he published *A Seven Months' Run Up and Down and Around the World.*

BROOKS, John, m. d., 1752–1825; an American patriot who, on hearing of the affair at Lexington, marched to the place from Reading with a company of minute-men just in time to see the British in retreat. He served in the war, and was frequently promoted. After the peace, he resumed the practice of medicine at Medford, and in 1816 was elected governor of Massachusetts, and re-elected annually until 1823, when he refused to be longer a candidate.

BROOKS, Maria Gowen, 1795–1845; b. Mass.; an American poetess, by Robert Southey called "Maria del Occidente." She lost her father when young, and was protected and educated by her future husband, a Mr. Brooks, a merchant of Boston. After his death, she went to Cuba, and in 1830 visited London and Paris. Some of her works are *Judith, Esther, and other Poems; Zophiel, or the Bride of Seven; Idomen, or the Vale of Yumuri;* and *Ode to the Departed.*

BROOKS, Peter Chardon, 1767–1849; a successful business man of Massachusetts; in boyhood on a farm; engaged in marine insurance in Boston, where he made a fortune; for several years president of the New England insurance company. After retiring from business, he was active and liberal in benevolent enterprises. As a member of the legislature he did what he could toward the suppression of lotteries.

BROOKS, Phillips, b. Mass., 1835; graduate of Harvard, and from 1859 to 1870 rector of Episcopal churches in Philadelphia; in the latter year becoming rector of Trinity church, Boston. He is celebrated as a pulpit orator, and as a vigorous and independent thinker. His freedom from the ordinary sectarian trammels, his liberal views of doctrine, with his profound convictions as to vital Christian truths, and his deeply spiritual yet intensely practical preaching, give him great popular power.

BROOKS, Preston S., 1819–57; graduate of South Carolina college; was in the state legislature, and served in the war with Mexico. In 1853, he was a member of congress, and was re-chosen in 1854. May 22, 1856, he assaulted senator Sumner, striking him over the head with a cane while in his chair in the senate chamber, and severely injuring him. The house of representatives did not expel him, though a committee reported in favor of doing so; but he resigned, only to be immediately re-elected by his constituents. He died suddenly of inflammation of the throat before the close of the second month of his term.

BROOKVILLE, Va. See page 879.

BROOM, a name given to a number of species of shrubs of the closely allied genera *cytisus, genista,* and *spartium,* of the natural order *leguminosæ,* sub-order *papilionaceæ*— all of them having long slender branches, along which are produced axillary flowers. The genera differ in the form of the standard (see Papilionaceæ), which is roundish in *spartium,* broadly ovate in *cytisus,* and oblongo-ovate in *genista,* whilst *spartium* has also an acuminate keel, and that of *cytisus* is very obtuse, that of *genista* being oblong and not wholly including the stamens and pistil. The legume is many-seeded in all, the

calyx 2-lipped, and the filaments united in a tube.—Common B., *cytisus scoparius*, the trivial name being from the Lat. *scopæ*, long twigs, or a besom—which has by different botanists being ranked in each of the genera just named, although it possesses the characters above assigned to *cytisus*, but has recently been made the type of a new genus, under the name of *sarothamnus scoparius* or *communis*—is a well-known native of Britain and of the continent of Europe, growing in dry soils, and ornamenting hedge-banks, hills, and bushy places, in May and June, with its large yellow flowers, which are on short stalks, drooping, solitary, but produced in considerable number along the straight slender branchlets. The whole aspect of the plant is graceful. The lower leaves have three oblong leaflets, the upper ones, or bracts, are simple; the branches are angular and of a very dark green, very tough, and much in use for making besoms. They have also been used for tanning and dyeing; and their fiber has been woven into a coarse strong cloth, and even made into paper. The whole plant is very bitter, with a peculiar nauseous taste and smell when bruised. The young tops and seeds are used in medicine, being powerfully diuretic, and very beneficial in some kinds of dropsy. They are also mildly laxative, and in large doses emetic. They are commonly administered in the form of a decoction. B. inhabits colder climates than furze, reaching to a greater elevation on mountains, and being found beyond the northern limit of furze. It varies in size from a very humble shrub to one of 20 or even 30 ft. in height, and when it reaches this size, the wood is of great value for the finer purposes of cabinet-makers and turners.—Irish B., *cytisus* or *sarothamnus patens*, not unfrequent as an ornamental plant in British shrubberies, is not at all a native of Ireland, but of Spain and Portugal.—Portugal B., or White B., *cytisus albus*, a native of the countries bordering on the Mediterranean, is very often planted in Britain as an ornamental shrub, and is much admired for the beauty of its fascicled white flowers, which are produced upon long filiform branches. Its leaves have three leaflets. It sometimes attains a height of 15 or 20 feet.—Spanish B., *spartium junceum*, is a native of the s. of Europe, generally growing in dry soils and rocky situations, and attaining a height of 8 ft. or upwards. Its branches are upright, round, and rush-like, a characteristic of this genus. They are smooth, and bear only a few small simple leaves, which soon drop off. The fiber of the branchlets is much used in some parts of Italy, France, and Spain, for making cloth, ropes, etc. In the s. of France, the plant is cultivated on dry unproductive soils. The branchlets are made into bundles, dried, beaten, steeped, and washed, in order to the separation of the fiber. It possesses medical properties similar to those of the common B.—A white-flowered species, *S. monospermum*, occasionally to be seen in British shrubberies, grows abundantly on the loose sands of the coasts of Spain, and produces a similar fiber. It is mentioned by Barth as growing in great abundance in Africa to the s. of the great desert. Many species somewhat resembling these are occasionally to be seen in Britain among ornamental plants, some of them often in greenhouses. The Canary isles produce some remarkable for the fragrance of their flowers. The name B. is not given to those species of *cytisus* (q.v.) and *genista* (q.v.) which do not display in a marked degree the character of having long slender twigs.—Butcher's B. (q.v.) is a plant of an entirely different family.

BROOM-CORN, a grass cultivated in North America for the manufacture of brooms and whisks, which are made of the tops of the culms and the branches of the panicle. It is regarded as a mere variety of the same species (*sorghum saccharatum*), of which the shaloo, or sugar-grass (see SUGAR-CANE and DURRA), is another variety. It has been much longer cultivated in North America, however, than the sugar-yielding variety. Its introduction is ascribed to Dr. Franklin, who, seeing an imported whisk in the possession of a lady of Philadelphia, found a single seed on it, and planted it. It is said to have been brought from the East Indies. It is now extensively cultivated in all parts of the United States, and especially by some branches of the religious society called Shakers. The manufacture of brooms is annually becoming of greater importance, much capital being invested in it. The crop of broom-corn has a beautiful appearance when near maturity. It often attains a height of 12 to 15 feet. The stalks are long and hard, and mostly used for manure, although cattle will feed on them before they are touched by frost, and cattle are very fond of the leaves. The seed is used like Indian corn, for feeding poultry, and sometimes for feeding cattle and horses. The usual practice in harvesting broom-corn is to bend the stalks 2½ to 3 ft. from the ground, and leave them a few days to dry, then to cut them over 6 to 8 in. below the panicle, laying the tops in heaps, to be conveyed to the scraper, which is often wrought by horse-power, and which removes the seed from them. Improved machinery has recently begun to be employed in the manufacture of brooms and whisks from broom-corn, and they are therefore produced with much greater rapidity than before. It is supposed that, in 1860, about 10,000 acres of broom-corn were cultivated in the state of New York, 9000 in Illinois, 6000 in Ohio, and about an equal amount in all the other states of the Union, or 30,000 acres in all; the value of the produce about $1,590,000. Great numbers of brooms and whisks of this material are exported to Britain.

BROOME, a co. in s. New York, on the Pennsylvania border; 680 sq.m.; pop. '75, 42,149; in '80, 49,481. It is drained by the Susquehanna, Chenango, Otselic, and other streams, and intersected by the New York and Erie, Albany and Susquehanna, Syracuse

and Binghamton, and Delaware, Lackawanna and Western railroads, and the Chenango canal. Productions agricultural, including an immense quantity of butter. Co. seat, Binghamton.

BROOME, William, LL.D., 1689–1745; coadjutor of Pope in translating the *Odyssey*. For writing all the notes and translating eight books of the Greek text, B. received $2500; but Pope loved money, and when the small price became notorious it annoyed the poet so that he abused B. in the *Dunciad* and in the *Bathos*. B. published a *Miscellany of Poems*, and translated some of Anacreon's odes. He was a rector in Suffold.

BROOMRAPE. See Orobancheæ.

BROOMS. See Brushes and Brooms.

BROPHY, George. See page 879.

BRORA BEDS are a series of strata occurring at Brora, a village in Sutherlandshire, of the same age as the inferior oolite of Yorkshire. They are chiefly remarkable for the occurrence in them of a seam of coal of good quality 3½ ft. thick, being the thickest stratum of true coal hitherto discovered in any secondary strata in Britain.

BROSSES, Charles de, a learned French historian, was b. at Dijon, Feb. 8th, 1709. His first work was *Lettres sur l'Etat de la Ville d'Herculaneum*, the result of a tour through Italy in 1739. At the suggestion of his friend Buffon the naturalist, he wrote the *Histoire des Navigations aux Terres Australes* (1756), in which he described the supposed great southern continent under the several names of Magellania, Australia, and Polynesia. The last two of these names, now commonly used, were first employed by B. His next work was *Du Culte des Dieux Fétiches*, etc. (1760). It was followed by a *Traité de la Formation Mécanique des Langues* (1765), which, in spite of many errors, contains not a few novel and ingenious observations and conjectures. During the greater part of his life, B. was occupied in endeavoring to supply the *lacunes* in the works of Sallust; and having collected about 700 fragments by this historian, he published, with such interpolations as he deemed necessary, the *Histoire de la République Romaine dans le cours da Septième Siècle, par Salluste* (1777). B. died as president of the parliament of Burgundy, May 7, 1777. His letters from Italy, under the title *Italie il y a cent Ans*, were edited and republished by his son René, count de Brosses, in 1834.

BROTH is an infusion or decoction of vegetable and animal substances in water. It is customary to use more or less meat, generally ox-flesh, with bone, and certain vegetables, as cabbage, greens, turnips, carrots, pease, beans, onions, etc. The whole are mixed together in cold water, heat slowly applied, and the materials allowed to simmer for some hours. The meat yields up certain ingredients, whilst others are retained in the residual flesh. The following table will illustrate this.

Ox-flesh heated with water

Yields to the Water.	Leaves in the Boiled Meat.
Albuminous matter.	Fibrin.
Gelatine.	Coagulated albumen.
Kreatine.	Gelatinous tissue.
Extractive matters or osmazome.	Fat.
Lactic acid.	Nervous matter.
Salts.	
Fat.	
Saccharine matter.	

The vegetables yield albuminous constituents, coloring and mucilaginous matter, and volatile oils and salts.

The real nutritive material present in B. is less than is generally thought, though it aids in satisfying the cravings of the appetite. To invalids, however, the form of B. known as beef-tea (q.v.) is of great importance, as it affords the weak and sickly stomach a light palatable article of diet at a time when stronger food would do the weakened system much harm. See Nutrition.

BROTHERHOODS, Religious. These were societies instituted for pious and benevolent purposes, and were numerous in the middle ages. Their origin is probably to be traced to the desire which then prevailed to imitate the spiritual orders. They were usually founded at first without ecclesiastical authorization, on account of which, several of the confraternities that either did not seek or did not obtain the recognition of the church, assumed the character of sects, and were suspected of heresy. To this class, among others, belonged the Beghards and Beguines (q.v.), the Brothers and Sisters of the Free Spirit (see below), the Apostolic Brethren (q.v.), the Flagellants (q.v), who, tolerated by the church for a while, at last incurred its displeasure, and were severely persecuted. We may also reckon among religious B. the old building corporations, from which sprang the order of Freemasons, the religious character of whose secret societies indicated, in the opinion of the church, a peculiarly dangerous gnosis and symbolism. Others coming into existence under ecclesiastical oversight, or at least being confirmed by the church, had no *arcana*, but were simply dedicated to the promotion of religion, either by the imposition of new penances the acceptance of new and severer devotions, or the assisting of strangers, travelers the unprotected, the oppressed, the destitute, and

the sick. Nor can we refuse our admiration and approbation to such self-denying fraternities, when we remember how defective were the early communities in charitable institutions. They were most numerous in Italy, Rome alone boasting more than a hundred.

Brothers and Sisters of the Free Spirit, a sect which sprang up in the Rhine country during the 13th c., and afterwards spread into France and Italy. It grounded its peculiarities on the biblical doctrine that the Holy Spirit is a spirit of "freedom." Misunderstanding the true nature of spiritual freedom, the members of this sect conceived themselves released not only from the thraldom of the church, but also from the obligations of morality. They set aside the marriage-tie, and indulged in licentiousness. A few even maintained that the deeds of the body could not possibly affect the soul. Intellectually, they are said to have been given to Pantheism. The synods of Cologne in 1306, and of Treves in 1310, decreed their suppression, and in the persecutions which ensued, they appear to have been completely dispersed.

The Brethren of Social Life, Brethren of the Common Lot, or Brethren of Good Will (also called Hieronymites and Gregorians, from Hieronymus and Gregory the great, whom they claimed as patrons), a fraternity founded about 1376 by Geert Groote (b. at Deventer, 1340, d. 1384) and Florentius Radewin (b. 1350, at Leerdam, in s. Holland, d. 1400). This society—which professed to be a copy of the earliest Christian communities, and was in several respects a forerunner of the subsequently formed societies of United Brethren, now sometimes styled Moravians—was composed of persons who sought after pious and spiritual exercises without any conventional distinctions of order, etc. Community of goods, ascetic habits, industry, care of the education of young persons, and the use of the vernacular language in divine service, were some of the chief points insisted on by the brethren, who were not fettered by monastic or any other vows. Perfect community of goods was a rule of their societies. Despite the persecutions which they suffered from the mendicant friars, they were recognized and sanctioned by several popes and by the council of Constance. They became most numerous in the Netherlands and n. Germany, but also spread themselves in Italy, Sicily, and Portugal, so that, in 1430, they reckoned more than 130 societies. The last was founded at Cambray in 1505. Several brotherhoods of Gregorians assisted in the reformation. In other cases, their institutions fell into the hands of the Jesuits. Though the original founders of these societies were opposed to all learning and science which was not purely moral and practical, their followers rendered most important services to popular education, having free schools in connection with many of their houses, supporting students at other schools, and distributing useful books. They have, indeed, been not incorrectly described as pioneers of the reformation. After the revival of learning in Italy, the Brethren of Social Life entered into the spiritual activity of the time. The most important and distinguished members of the society were Gerhard Zerbold of Zütphen, Thomas-à-Kempis, and the learned cardinal Nicholas Cusa.—Female societies, of a similar character, sprung up at the same time with those of the Brethren of Social Life. At the head of each was a superior or directress, who was styled the *Martha*.

BROTHER JONATHAN, a synonym for the people of the United States, as "John Bull" is for the people of England. When Washington took command of the revolutionary forces in New England, he found an immediate necessity for arms and other war materials, Jonathan Trumbull was then governor of Connecticut, a man of excellent judgment, and a highly esteemed friend of Washington. It happened that at an important council of officers where the wants of the service were the topic under consideration, Washington remarked, in reference to some knotty question: "We must consult Brother Jonathan," meaning governor Trumbull. The expression was repeated on occasions of difficulty, and before the war closed it was established as a convenient name for the whole people.

BROTHERS, a name given to a group of six or eight rocky islets immediately outside the strait of Bab-el-Mandeb, varying in height from 250 to 350 feet. They lie off the African coast about 9 m. s. of the island Perim, now occupied by England. Of the loftiest point, the lat. and long. respectively are 12° 28′ n., and 43° 22′ e.—Brothers is also the name given to three isolated mountains near the coast of New South Wales, between Harrington inlet to the s., and Port Macquarie to the n., or between lat. 32° and 31½° south. They are valuable as landmarks.

BROTHERS, Law of Descent among. In the law of England, this was immediate, without reference to the parent as the *commune vinculum;* but by the 3 and 4 Will. IV. c. 106, s. 5, it is enacted that no brother or sister shall be considered to inherit immediately from his or her brother or sister, but every such descent shall be traced through the parent. See Inheritance.

BROTHERS, Lay, an inferior class of monks, not in holy orders, but bound by monastic rules, and employed as servants in monasteries (q.v.).

BROTHERS, Richard, a fanatic, whose prophecies and writings excited an unusual sensation in his day, was at one time a lieut. in the British navy, which he quitted in 1789. Refusing, from conscientious scruples, to take the requisite oath to enable him to receive his half-pay, he was reduced to great distress, and ultimately placed in the

workhouse. Dating his first call from 1790, he announced himself, in 1793, the apostle of a new religion, "the nephew of the Almighty, and prince of the Hebrews, appointed to lead them to the land of Canaan." In 1794, he published a book, in two parts, entitled *A Revealed Knowledge of the Prophecies and Times*, etc.; and, in 1795, an *Exposition of the Trinity*. He was the author of several other publications, marked by a strange mixture of reason and insanity. In consequence of prophesying the death of the king, and the destruction of the monarchy, he was committed to Newgate, but soon liberated. Some of his political predictions, especially in reference to the state of the continent, were either altogether or partially fulfilled; and many persons were induced to sell their goods, and prepare to accompany him to his New Jerusalem, which was to be built on both sides of the river Jordan, where he was to arrive in the year 1795. His disciples were not confined to the poor and ignorant, but even men of ability and education were deluded into believing in him, two of the most eminent being Nathaniel Brassey Halhed, esq., M.P., the orientalist, and Sharp, the celebrated engraver. As a dangerous lunatic, he was at length, by order of government, committed to Bedlam, but released April 14, 1806, and died Jan. 25, 1824.

BROTHERS AND SISTERS OF CHARITY. Under these names, there exist in the Roman Catholic church two widely ramified beneficent societies, for the nursing of the poor and sick in hospitals, without distinction of faith, rank, or nation. The order of the brothers of charity, or Compassionate Brothers, was established in 1540, at Seville, in Spain, by the Portuguese John di Dio (died 1550), who had served in Africa under Charles V. The funds for the purpose were obtained by begging. The primitive object of the society was the care of the sick, and the reformation of women of immoral character: it was composed of lay-members, under no rule. In the year 1572, the order received the papal recognition, and was subjected to the rule of St. Augustine. All the privileges of the mendicant orders were conceded to it in the year 1624, and it was then divided into a Spanish congregation, with a maj.gen. in Granada, and an Italian or extra-Spanish congregation, with a maj.gen. in Rome. To the latter belong also the brothers of charity in Switzerland, Germany (where Austria is their chief seat), Poland, the Netherlands, France, and other countries. The European members of the order clothe themselves in black; the extra-European, who are under a separate gen. of their order in America, wear brown. Their services to distressed humanity continue to be held in high estimation. The sisters of charity, formerly also, on account of their dress, called *gray sisters*—independent associations of unmarried Christian females, for the alleviation of human suffering, especially for the tending of the sick and the poor—were first called into existence in France, in 1634, by Vincent de Paul (born 1576), greatly assisted by the noble-hearted and self-devoted widow, Le Gras, by birth De Marilac. The society was recognized in 1655 by Clement IX., and in 1685 already numbered 224 convents. The French revolution sorely interrupted the abundant and benevolent labors of the sisters of charity by the suppression and proscription of their convents in France; but Napoleon restored the order in 1807 by the convocation of a general chapter of the scattered sisters, under the presidency of the empress mother, and by the grant of the necessary funds; and there exist at present more than 300 associations in France, where, in the villages, elementary education is in great part conducted by them. They attend the sick in all the great hospitals. There exists in Germany a Roman Catholic association of unmarried females, not bound by conventual rules, and possessing the right of withdrawing from the association at pleasure, but placed under a strict supervision, and occupied in the same duties as the sisters of charity. The institute of deaconesses (q.v.) in the Protestant churches of the continent of Europe is of a very similar character.

BROUGHAM, HENRY, Lord BROUGHAM AND VAUX, was b. in Edinburgh, 19th Sept., 1778. His father, Mr. Henry Brougham, was the descendant of an ancient family in Westmoreland, and his mother, Eleonora Syme, who was a woman of much talent, was a niece of Robertson the historian. B. received his education at the high school, and afterwards at the university, of Edinburgh. He gave early promise of future ability, some mathematical papers written by him at the age of eighteen having been considered worthy of publication in the transactions of the royal society. He spent some time in traveling on the continent, and in 1800 was admitted to the Scotch bar. In company with Jeffrey, Horner, and Sydney Smith, B.'s first public efforts were given to the service of the *Edinburgh Review*, and he contributed to it some of its most powerful articles. His liberal political views excluded him from the hope of promotion in Scotland, and a character which he had acquired for eccentricity and indiscretion, excluded him from all legal practice, except the unremunerative practice of the criminal courts. After seven years of vain attendance in the courts at Edinburgh, he betook himself to a field more worthy of his ambition, and in 1808 passed at the English bar.

In London, B. first attracted public notice by the admirable appearance he made at the bar of the house of commons, when he was employed on behalf of certain Liverpool merchants to ask the repeal of the orders in council. Soon after this, in 1810, he entered parliament, and within a few months of the time of taking his seat, brought in and carried his first public measure—an act making participation in the slave-trade felony. He was welcomed by the opposition leaders, to whose party he had attached himself, as a

most powerful assistant in their attacks upon the government. B. succeeded in carrying the repeal of the obnoxious orders in council shortly before the general election of 1812, and then ventured to contest, along with another whig, the membership for Liverpool against Canning and another tory. He was defeated, and remained without a seat in parliament till 1816, when he was returned for Winchelsea, and again became an active member of the opposition. By this time he had also established some reputation in the courts of law. He never, indeed, acquired a very large practice, but he repeatedly distinguished himself by speeches of great vigor and ability in the defense of persons prosecuted for libel by the crown. His most famous appearance as an advocate, however, was in defense of queen Caroline, when, along with Denman, he defended the injured queen with unequaled courage and disinterestedness, at the cost, as both well knew, of exclusion, for years to come, from all professional advancement. But his eloquence and boldness, though they forfeited for him the favor of the crown, gained him that of the people, and for the ten years between 1820 and 1830, B. was the popular idol. He made no bad use of his power. In 1822, he used it, though in vain, in support of a scheme of national education; and to his activity is owing, in great measure, the establishment of the London university, of the first mechanics' institute, and of the society for the diffusion of useful knowledge. In 1830, B. delivered a most powerful speech against slavery, and in consequence of it—as he himself believed—was invited to stand, and returned, as member for the great popular constituency of the co. of York. The aristocratically disposed whigs would—had they dared—have excluded B. from the reform ministry; but, in addition to having enormous popularity, he was virtually their leader in debate in the commons, and was thus, in spite of his unmanageableness, indispensable. After various intrigues, B. was offered, and was persuaded, against both his interests and his inclinations, to accept a peerage and the chancellorship. He took his seat in the lords in Nov., 1830, and assisted very materially in carrying through that house the great measures then proposed by the liberal ministers. He shared in the general unpopularity which afterwards attached to them, and when they were dismissed by William IV. in 1834, B. left office, never to return to it. After that time, he held in the upper house a position as nearly analogous as may be to that formerly held by him in the commons, criticising freely the conduct of successive administrations, and steadily forwarding every measure for social progress.

It will be as a law-reformer that B. will be best remembered. He took up Romilly's uncompleted task of carrying into practice the ameliorations suggested by Bentham. His efforts in this direction began as early as 1816, when he introduced into parliament a bill to remove various defects in the law of libel. In 1827, in a memorable speech which occupied six hours in delivery, B. enumerated the defects in nearly every branch of English law, and made proposals for dealing with law-reform on a proper scale. These, as might have been expected, met with little encouragement. It has been the fortune of many of his measures to be carried afterwards, in a mutilated form, by other hands. After he left office, B. also succeeded in carrying various reforms in the law, among which may be noted some very extensive changes in the law of evidence. Among the measures proposed by B., but left for future law-reformers to carry, were bills for the codification of the criminal law, for the establishment in England of a system of public prosecutors, and for the giving of compensation to parties acquitted. Lord B.'s acts and bills, as well those regarding the slave-trade, education, and other public questions, as those touching on law-reform, have been collected and published by sir J. E. Eardly Wilmot (Lond., Longman, 1857). The large well-filled volume which they form is the most fitting monument that could be preserved of the activity, perseverance, and public spirit of the man.

As an orator, more especially as a debater in parliament, B. was, among the men of his time, inferior only to Canning. He was wont, however, to indulge in his speeches in too large an admixture of exciting elements: argument was mingled with fiery declamation; ridicule, sarcasm, invective, were freely used; and these he dealt out with a vehemence and energy that at times carried him far beyond bounds. The power of ready, rapid, and forcible diction was eminently his. In many other fields besides oratory, B. has won a high reputation. He cultivated mathematical and physical science with success, and ventured upon the domain of metaphysics, and even of theology. His miscellaneous writings are of great extent, and upon an almost incredible variety of subjects. They were, however, intended more to serve purposes of the moment, than as permanent additions to our literature; and though they display great powers of rapid comprehension and nervous clear exposition, it cannot be said that we are indebted to their author for any new truths in politics or morals, or any original discoveries in science. The honors due to men of letters B. did not fail to acquire, having successively been made lord rector of Glasgow university, president of university college, London, member of the institute of France, chancellor of the university of Edinburgh, and lastly, D.C.L. of Oxford.

Lord B. took a warm interest in legal and social reform. While not engaged in parliament, he resided chiefly at Cannes, in the s. of France, where he died May 7th, 1868. His lordship married, in 1819, Mary Anne Eden, the granddaughter of a baronet in the co. of Durham. The issue of this marriage was two daughters, who both died before reaching womanhood. The patent of the title to the peerage was extended to make it

descend to the family of his brother. B. left a memoir of his life and times, which was published in 3 vols. (1871).

BROUGHAM, JOHN, b. Ireland, 1810, d. N. Y., 1880; studied surgery for a considerable time, but was obliged to leave school on account of adversity, and went to London, where he proposed to enter the East India service; but an old man gave him a guinea, and urged him to seek some fitter employment. Happening to meet an old acquaintance, he got an engagement in the prince of Wales theater, and there in July, 1830, he acted six parts in the old play *Tom and Jerry*. In 1830, he was a member of the company organized by Madame Vestris. About this time he wrote his first play, a burlesque, prepared for William E. Burton, then acting in London. In 1840, he was a member of the Lyceum, for which theater he wrote a number of plays. He came to the United States in 1842, and appeared in the old Park theater in New York city. Soon after he joined Burton's company in Chambers street; and here also he wrote a number of plays, among which were *Vanity Fair*, *All is Fair in Love*, *Dombey and Son*, and the *Irish Emigrant*. Afterwards he managed Niblo's Garden, and in Dec., 1850, he opened Brougham's Lyceum on Broadway, where he produced *David Copperfield*, and a new version of the *Actress of Padua*, the latter written for Charlotte Cushman. He then connected himself with Wallack's company, in which he remained until 1860; then managed the Bowery theater, reviving *King John* with superb scenery. Meanwhile he was writing plays, among which were the *Game of Love*, *Bleak House*, *A Decided Case*, *Game of Life*, *Playing with Fire*, *Pocahontas*, *Love and Murder*, *Romance and Reality*, etc. After several seasons at Wallack's, he rejoined Burton and produced his burlesque of *Columbus*, and other plays. In 1860, he went to England, where he remained five years, and there too he was writing and adapting plays, among them the *Duke's Motto*, for Mr. Fechter. He reappeared in New York in Oct., 1865, and not long after again joined Wallack's company, with which he remained until the close of his life. Among his later plays are *John Garth*, and *The Lily of France*.

BROUGHTON, JOHN CAM HOBHOUSE, Lord, 1786–1869; an English statesman. At his death the peerage became extinct, as he left no male issue. In his school days at Cambridge he was the intimate friend of Byron, and the two made a tour of southern Europe at a later period. He was a radical, and, in 1816, wrote a book to correct certain current misrepresentations of the events of the *Hundred Days in Paris*. The work gave great offense both in England and France. The translator and printer in Paris were sentenced to fine and imprisonment for an "atrocious libel," and in London he was confined in Newgate nearly three months. As a martyr to toryism, he tried for parliament in the borough of Westminster, but was defeated, though chosen by a large majority only two years later. For 12 years he was an ardent and courageous advocate of liberal measures, among them the repeal of the test and corporation acts, and Roman Catholic emancipation. In 1831, he became a baron, and in the same year was secretary of war in the Grey ministry. Subsequently he was chief commissioner of woods and forests, and president of the board of control. In 1851, he became a peer, and ceased to participate in public life. Lord B. published *Imitations and Translations from the Classics; Journey through Albania with Lord Byron;* and *Historical Illustrations of the Fourth Canto of Childe Harold*.

BROUGHTY-FERRY, a t. of Forfarshire, on the firth of Tay, 4 m. e. of Dundee. Pop. '71, 5817. It is connected with Ferry-Port-on-Craig, in Fifeshire, by a railway-ferry over the firth, here a mile broad, which, before the opening of the Tay bridge, formed the chief connection between Edinburgh and Fife with Dundee. It has cod and other white fisheries. Many Dundee merchants occupy fine villas at Broughty-Ferry. On the shore stands an ancient castle, lately repaired as a defense for the Tay.

BROUS'SA, or BOUR'SA, the ancient *Prusa*, where the kings of Bithynia usually resided, situated in lat. 27° n., long. 40° e., at the foot of Mt. Olympus, in Asia Minor. Prusa is said to have been built by Prusias, king of Bithynia, who waged war with Crœsus or Cyrus. Seifeddulat, of the race of Hamadan, took it in 336 of the Hegira, but it was retaken by the Greek emperor in 947 A.D. In 1356, Orcan, son of Othman, the second emperor of Turkey, captured it, and made it the capital of his empire, and it continued so until the taking of Constantinople by Mohammed II. in 1453.

B. is most pleasantly situated, facing a beautiful and luxuriant plain, covered for many miles with plantations of mulberry-trees. The city and suburbs are about 6 m. in circumference. The town is divided from the eastern suburb by a deep channel or vale, over which there are several bridges, one of them—with shops on each side—being 90 paces long and 16 broad. The streets are remarkably clean, and the bazaars very good, being supplied with European goods from Constantinople. The pop. of B. amounts to 73,000 souls, of whom about 11,000 are Armenians. It contains a great number of mosques, some of which are very fine buildings. The silks of B. are much esteemed in the European markets, and great quantities are exported every year to France, Constantinople, and Smyrna, The inhabitants manufacture a kind of silk, like satin, mostly striped, which is used for the under-garment of the oriental dress; also a material from silk and flax used chiefly for shirts; and a sort of gauze, called "brunjuke," which is much worn by the Turkish ladies for under-garments. A great quan-

tity of British manufactured goods, such as Manchester "twists," "gray calicoes," "prints," "zebras," etc., are imported into B., the goods being landed at Constantinople, and thence conveyed overland to Broussa. It is the official residence of a Turkish pasha, and the seat of a Turkish tribunal. B. is subject to frequent earthquakes. In ancient times, it was famous for its thermal baths, or "royal waters," as they were called, which still exist.

BROUSSAIS, François Joseph Victor, the founder of the school of medicine, was b. at St. Malo, Dec. 17, 1772, and in early life, after studying at Dinon, served for a time first in the navy, and then in the army. In 1820, he was appointed first professor at the military hospital of Val-de-Grace. In 1832, he became professor of general pathology and therapeutics in the faculty of medicine in Paris, and afterwards was made a member of the institute. He died at his country residence at Vitry, Nov. 17, 1838. In 1841, a statue was erected to his memory in the court of Val-de-Grace. B.'s peculiar views are ably explained in his chief works—the *Histoire des Phlegmasies ou Inflammations Chroniques* (1808), and *Examen de la Doctrine Médicale généralement adoptée* (1816), which assert the following principles: that life is sustained only by excitation; that this excitation may be either too strong (*surexcitation*) or too weak (*adynamie*), the latter case, however, being far less frequent than the former. These abnormal conditions of surexcitation and adynamie at first manifest themselves in a specific organ of the body; but afterwards, by sympathy, are extended to other organs; that is, all diseases are originally *local*, and become *general* only by sympathy of the several organs. The organs most subject to disease are the stomach and bowels, and therefore *gastro-enteritis* (inflammation of the stomach and the intestines) is the basis of pathology; consequently, B. resorted to local phlebotomy—especially the application of numerous leeches to the region of the abdomen—as a remedy in fevers and various diseases. His theory and practice gained many adherents in France, who took the name of the "physiological school." But a more exact knowledge of physiology has demonstrated that the views of B. were one-sided and exaggerated. Yet they have not been without use in pathology, as they have led to a more careful study of pathological anatomy and physiological sympathies, and to a more exact observation of the so-called specific morbid processes of which the existence was denied by B. and his followers. Montègre, *Notice Historique sur la Vie, les Travaux, et les Opinions de Broussais.*—His son, Casimir B., born 1803, professor at Val-de-Grace (1833), was a zealous adherent of the Broussais system, and is the writer of a work, *Hygiène-Morale*, based on phrenology.

BROUSSON, Claude, 1647–98; a French Protestant, an advocate and legal defender of the Huguenots. His house was the rendezvous of certain leaders of an outbreak, and he was compelled to fly from the city (Toulouse), barely escaping into Switzerland. He ventured into France twice afterwards, at great peril; but in 1698 he was caught, after many escapes, and sentenced to be broken on the wheel on the charge of treasonable conspiracy with the duke of Schomberg to invade France. He was executed accordingly, Nov. 4, 1698. He left a number of works on the subjects of the period.

BROUSSONET, Pierre Marie Auguste, 1761–1807; a French naturalist educated in medicine, and a professor at the age of 18. He labored zealously to establish the Linnæan system of botany in France, and visited England, where he was admitted to the royal society, publishing in London *Ichthyologiæ Decas I.* In Paris he was perpetual secretary of the society of agriculture, and a member of the electoral college of the city. Subsequently he visited Madrid and Lisbon, and went as physician to an embassy which the United States sent to the emperor of Morocco. Still later he was French consul at Teneriffe; in 1797 a member of the institute, and in charge of the botanical garden at Montpellier. He died of apoplexy soon after his election to the national legislative body. France is indebted to him for the introduction of the Merino sheep and the Angora goat.

BROUSSONE'TIA. See Mulberry.

BROUWER, Adrian, 1608–40; a Dutch painter. He was apprenticed to Frank Hals, who treated him with great severity, and drove him to dissipation and the low life so well depicted in his works. The best collection of his pictures is in the Munich gallery.

BROWN : co. Dak. See page 880.

BROWN, a co. in Illinois, on the Illinois river; 320 sq.m.; pop. '80, 13,044. In part prairie and in part wooded, with fertile and well-cultivated soil. It is intersected by the Toledo, Wabash, and Western railroad. Agriculture is the main business. Co. seat, Mount Sterling.

BROWN, a co. in s. Indiana; 320 sq.m.; pop. '80, 10,264; well wooded, and with tolerably productive soil. Agriculture is the chief occupation. Co. seat, Nashville.

BROWN, a co. in n.e. Kansas on the Nebraska border; 576 sq.m.; pop. '78, 10,446; in '80, 12,819. The co. is crossed by the St. Joseph and Denver City railroad. Productions, grain, hay, butter, and cattle. Co. seat, Hiawatha.

BROWN, a co. in s. Minnesota, on the Big and Little Cottonwood; 450 sq.m.; pop. '80, 12,018. Chief business, agriculture. Co. seat, New Ulm.

BROWN, a co. in s.w. Ohio, on the Ohio river; 502 sq.m.; pop. '70, 30,802; in '80, 32,726. Hilly near the river, but level inland; fertile and well cultivated. Produces grain, butter, sorghum molasses, and some wine. Co. seat, Georgetown.

BROWN, a co. in w. Texas, on Colorado river; 1050 sq.m.; pop. '80, 8415. Hilly and prairie surface, with rich soil. Chief business, stock raising. Co. seat, Brownwood.

BROWN, a co. in e. Wisconsin at the head of Green bay; 525 sq.m.; pop. '80, 34,090. Uneven surface; productions agricultural. The Wisconsin division of the Chicago and Northwestern railroad passes through. Co. seat, Green Bay.

BROWN, Benjamin Gratz, b. Ky, 1826; graduate of Yale; made his home in St. Louis, and in 1852 was a member of the legislature. In 1854, he started the *Missouri Democrat.* In the civil war he fought for the union, commanding a brigade. In 1863, he was a United States senator from Missouri, and in 1872 was the democratic candidate for vice-president.

BROWN, Chad, d. 1665; he left Massachusetts in 1636 because of differences with the leaders of the colony, and settled in Rhode Island, where he became an elder in a Baptist church, and the progenitor of many prominent citizens.

BROWN, Charles Brockden, a celebrated American novelist, was b. at Philadelphia, Jan. 17, 1771. His early education was carried on under the care of Mr. Robert Proud, author of the *History of Pennsylvania.* Afterwards he studied for the law, but the license which he had already given to his imagination induced an unconquerable aversion to legal pursuits, and he consequently betook himself to literature. The French revolution exercised on him, as on many other ardent spirits, a considerable influence; several of his writings at this period being penetrated with the new thoughts and sentiments which sprung out of that great convulsion. In 1798, he published *Wieland,* the first of his remarkable fictions; and in 1799, *Ormond, or the Secret Witness.* His next production was *Arthur Mervyn, or Memoirs of the Year* 1793—the fatal year of yellow-fever in Philadelphia. In 1801, appeared *Edgar Huntly, or the Adventures of a Sleep-Walker,* "a romance presenting a greater variety of wild and picturesque adventure, with more copious delineations of natural scenery, than is to be found in his other works."—*Prescott.* This was followed in the same year by *Clara Howard,* and in 1804 by *Jane Talbot,* first printed in England. He died of consumption in 1810.

Besides the writings which have been enumerated, B. composed a number of political pamphlets, contributed to various literary magazines, and founded three or four periodicals himself. The author who exercised the greatest influence on the development of his genius was Godwin, whom he occasionally imitated, while Godwin himself, on the other hand, acknowledged his obligations to B., and warmly admired him. The most striking quality of his mind is its ingenuity, both imaginative and psychological. He invents incidents and analyzes feelings with remarkable subtlety, but his success is somewhat marred by his extravagant departure from the realities of every-day life.

BROWN, Ford-Madox. See page 880.

BROWN, Francis, d.d., 1784–1820; a native of New Hampshire, and graduate of Dartmouth college, of which he became president in 1815. Some of his sermons and pamphlets have been published.

BROWN, Sir George, a distinguished British gen., b. at Linkwood, near Elgin, Scotland, in Aug., 1790; entered the army in 1806, became lieut. in 1807, and was present in the latter year at the capture of Copenhagen. He served in the peninsular war At the battle of Talavera he was severely wounded, and at the storming of Badajoz was one of the forlorn-hope. He was appointed maj., May 26, and lieut.col., Sept. 29, 1814, in which year he embarked in maj.gen. Ross's expedition against the United States of America, and was wounded at the battle of Bladensburg. From Feb. 6, 1824, to 1842, he commanded a battalion of the rifle brigade. He was made adj.gen. of the forces, April, 1850, and lieut.gen., 1851. In the Crimean war, 1854–55, B. commanded the light division. At the battle of Inkerman, Nov. 5, 1854, he was severely wounded, and obliged to retire for a short time to Malta. In 1855, he was created a knight commander of the bath. In the expedition to the sea of Azof, he commanded the British troops; and in the first unsuccessful attack on the Redan of Sebastopol, he had the chief command of the storming-party. He was gazetted, April 3, 1856, "gen. in the army for distinguished service in the field." He was a knight of Hanover, received the Turkish order of the Medjidie of first class in 1855; and the grand cross of the legion of honor, 1856. In 1860, he became commander-in-chief in Ireland, and in 1862 a privy-councilor. He died in 1865.

BROWN, George L., b. 1814 in Boston; an American painter, of whose productions the more notable are "The Crown of New England" (the White mountains), and "The Harbor of New York."

BROWN, Goold, 1791–1857; a grammarian; b. in Rhode Island; for 20 years a teacher in New York, and author of several elementary and progressive works on English grammar, the most important of which is his *Grammar of English Grammars.*

BROWN, Henry Armitt. See page 880.

BROWN, Henry Kirke, b. Mass., 1814; an American sculptor, well known for works in bronze. He studied portrait-painting in Boston, and after spending some years in Italy,

settled in Brooklyn, N. Y. He made the first bronze cast achieved in the United States. Some of his figures are "Hope," "The Pleiades," "The Four Seasons," and statues of De Witt Clinton, Washington, Nathanial Greene, Lincoln, and gen. Scott.

BROWN, Hugh Stowell, b. 1823; an English clergymen who left the established church and joined the Baptists; he soon became a leader, and is still very popular with the working classes.

BROWN, Jacob, 1775–1828; an American general commanding on the Canadian frontier in the war of 1812; he showed skill and courage in the defense of Sackett's Harbor, and in the battles of Chippewa and Niagara Falls. In 1821, he was chief in command of the United States army.

BROWN, J. Appleton. See page 880.

BROWN, James Baldwin, D.D. See page 880.

BROWN, John, D.D., b. 1715–66; an English divine and author; educated at Cambridge; served with distinction as a volunteer in 1745, and was about that time appointed chaplain. He is best known by his writings, such as *Honor*, and *Essay on Satire* (poems); the tragedy of *Barbarossa*, produced by Garrick, followed by *"Athelstone*, a satire on the manners and principles of the time; a *Dissertation on the Rise, Union, and Power, etc., of Poetry and Music.* He was affected with deep melancholy at times, and in the last of these afflictions committed suicide.

BROWN, John, of Haddington, once the most popular, and still among the most revered, theological writers in Scotland, was b. in 1722, at Carpow, near Abernethy, in Perthshire. Deprived of both his parents when only 11 years of age, he became assistant to a venerable and pious shepherd, named John Ogilvie, who tended his flock among the neighboring hills, and nursed the religious ardor of the boy's heart. B., however, aspired to be wise as well as good. His thirst for learning was insatiable, and the most romantic yet well-accredited stories illustrative of this are related by his biographers. While still a friendless "herd laddie," he had made great progress in a self-acquired knowledge of Greek and Latin. The extent of his acquisitions, even at this early time, may be estimated from the fact, that the country people round about believed he was in league with the devil, and that he had pledged his soul for unhallowed lore. At a later period of his life, "he knew nine or ten languages, classical, oriental, and modern, and had amassed vast stores of Puritan, Scottish, and Dutch divinity." After a brief career as a peddler—an employment which English readers will understand from Wordsworth's *Excursion* was neither mean nor degrading—B. became a volunteer in a regiment of militia raised in Fifeshire during the rebellion of 1745, and in 1747, schoolmaster in the neighborhood of Kinross. During the vacations of his school, he studied philosophy and divinity under the inspection of the Associate Synod, and the superintendence of the rev. Ebenezer Erskine and James Fisher. In 1750, he was ordained pastor of the Secession church at Haddington. Perhaps a more faithful, industrious, and holy minister never labored in Scotland. David Hume was once revailed upon to go and hear him, and the criticism of the great skeptic was: "That old man preaches as if Christ were at his elbow." Although self-educated, he had little of the narrowness which culture so obtained generally brings along with it; he corresponded on friendly terms with Episcopalians, and often expressed a warm affection for all true Christians. Although himself a sound Presbyterian, and a tolerably strict Calvinist, "the love of the Lord" was his real and ultimate test of a man's orthodoxy. In 1758, B. first appeared as an author. His work was entitled *A Help for the Ignorant*, etc. In 1765, he published his famous *Christian Jouural*, in which the common events of life are richly but quaintly, and perhaps somewhat artificially, spiritualized. In 1768, he was appointed professor of divinity under the Associate Synod, and in the same year issued his valuable *Dictionary of the Holy Bible.* In 1771, appeared his *History of the Church from the Birth of the Saviour*—a work good enough for cottage-reading, but possessing no merit otherwise; and in 1778, *The Self-interpreting Bible.* This last is B.'s *magnum opus*, and has been amazingly popular in Scotland; even high dignitaries of the English church have praised and recommended it. Besides these works, B. published a great variety of sermons, tracts, etc., which had an extensive popularity. He died on 19th June, 1787.

BROWN, John, M.D., founder of the Brunonian system of medicine, the son of a day-laborer, and himself first intended for a weaver, b. in 1735, in Bunkle parish, Berwickshire, was educated at the grammar-school of Dunse, in which he was subsequently an usher. After studying medicine at the Edinburgh university, he became tutor to the children of the celebrated Dr. Cullen, and assistant in his university lectures. Conceiving himself slighted by Cullen, he commenced giving lectures himself upon a new system of medicine, according to which all diseases are divided into the sthenic, or those depending on an excess of excitement, and the asthenic, those resulting from a deficiency of it; the former to be removed by debilitating medicines, as opium, and the latter by stimulants, such as wine and brandy. His system gave rise to much opposition, but his partisans were numerous; for a time his opinions had some influence. In 1779, B. took the degree of M.D. at the university of St. Andrews, and in 1780 published his *Elementa Medicinæ.* He was also author of *Observations on the Old System of Physic.* In 1786, being overwhelmed with debt, he removed to London, where he died of apoplexy in 1788. His works, with a memoir by his son, Dr. William Cullen Brown, appeared in 1804 (3 vols. 8vo).

BROWN, JOHN, 1736–1803; merchant of Providence, R. I.; the leader of the men who destroyed the *Gaspee*, an English sloop-of-war, June 17, 1772. He was arrested and put in irons, but escaped. He was a member of congress from Rhode Island, and a patron of Brown university.

BROWN, JOHN, 1744–80; graduate of Yale, and king's attorney in New York. In 1775, he was an emissary in Canada to provoke the people against the English government. He was with Allen at the capture of Ticonderoga, and at Quebec when Wolfe was killed. He was killed by Indians while on the way to help Schuyler in the Mohawk valley campaign.

BROWN, JOHN, 1757–1837; b. Va.; soldier in the revolutionary army. He was a student at Princeton and at William and Mary college; and after residing in Kentucky for a few years, returned to Virginia, and represented that state in congress, 1787–93. From 1793 to 1805, he was United States senator from Virginia.

BROWN, JOHN HENRY HOBART, S.T.D. See page 880.

BROWN, JOHN, D.D., grandson of John Brown, of Haddington, was b. 12th July, 1784, near Whitburn, Linlithgowshire. He studied at Edinburgh university, and afterwrds at the theological hall of the secession church in Selkirk. In 1806, he was ordained to the pastorate of a church in Biggar, a small town in Lanarkshire, where he labored for 15 years, employing his leisure hours in those studies which subsequently enabled him to take a high rank as a biblical expositor. In 1822, he was transferred to Rose street church, Edinburgh, and in 1829 to Broughton place church in the same city. In 1834, he was appointed professor of pastoral and exegetical theology in connection with the associate synod. He died 13th Oct., 1858. As a preacher, Dr. B. was among the first of his time. For clearness of scriptural exposition, chaste and powerful language, and majestic ardor and earnestness of manner, he had no equal in his denomination, and no superior in Scotland. The attractiveness of his delivery was heightened by a countenance singularly noble, tender, and sweet. Among his works are *The Law of Christ respecting Civil Obedience; The Resurrection of Life;* and his important and scholarly *Expository Discourses on the Epistles of Peter, on the Epistle to the Galatians, and on the Epistle to the Romans.* See Dr. Cairns's Memoir (1860).—JOHN BROWN, M.D., LL.D., son of the above, b. 1810, has attained a distinguished place among the medical practitioners of Edinburgh. He has also abundantly inherited the paternal genius, though in him it has taken a literary rather than a theological direction. In 1858, he published *Horæ Subsecivæ*, a volume of essays, most of which had previously appeared in periodicals. One of these, *Rab and his Friends*, has been since published separately, and has obtained a remarkable popularity. It excels in quaint fancy, rich delicate pathos, and abrupt but felicitous diction. A civil list pension of £100 was allotted to Dr. B. in 1876.

BROWN, Captain JOHN, the leader of the Harper's Ferry (U. S.) insurrection (1859), designed to incite the slaves of the southern states of America to rebellion, was descended from a Puritan carpenter, one of the *Mayflower* emigrants, and was b. at Torrington, Conn., in the year 1800. He intended to enter the ministry, but had to abandon his studies on account of weak sight, and subsequently became a wool-dealer. In 1854, having imbibed an intense hatred of slavery, he went to Kansas, in order to vote, and, if need were, fight, against the establishment of slavery in that territory. In many of the conflicts which ensued between the pro-slavery party from Missouri and the free settlers, B. played a prominent part, and in one of these he had a son killed, a circumstance which deepened his hostility against the southern party. After the agitation in Kansas was settled by a general vote, B. traveled through the northern and eastern states, declaiming against slavery, and endeavoring to organize an armed attack upon it. In Oct., 1859, at the head of 17 white men and 5 blacks, he commenced active hostilities by a descent upon Harper's Ferry, a town of some 5000 inhabitants, at the confluence of the Potomac and Shenandoah, and possessed of an arsenal containing from 100,000 to 200,000 stand of arms. The arsenal was easily captured, and 40 or 50 of the principal inhabitants were made prisoners; but instead of retreating at once to the mountains with arms and hostages, as his original design had been—meaning to exchange the hostages for slaves—B. lingered on in the town until the evening, by which time 1500 militiamen had arrived. Next day, an attack was made on his position, which, after some loss of life, was carried. B. was captured, and shortly after was tried for treason, and executed. He is described as a singularly brave and honest man.

BROWN, JOHN, b. Conn., May 9, 1800; d. Dec. 2, 1859; an American abolitionist, celebrated as the originator of the insurrection at Harper's ferry. He was intended for the ministry, but was compelled to give up study on account of inflammation in his eyes. With his family he removed to Ohio, where he worked as a tanner, and engaged in the wool trade, in which he failed. He then went to Essex co., N. Y., and began as a farmer, but in 1854 followed his four sons, who had settled in Kansas, and were subjected to much persecution on account of their opposition to slavery. When the free-state men organized to repel the Missourians who were besieging Lawrence, Brown and his sons were among the foremost on the free-state side; and a little later they made a remarkable defense against vastly superior numbers near Ossawattomie. After many rough adventures in the Kansas troubles, B. formed the project of an insurrection in the south among the slaves as the surest means of securing their liberation. He drilled

a small force in Iowa in the winter of 1857, and the next spring, in Canada, drew up a new provisional constitution for the states, under which he was selected as commander-in-chief, one of his sons, and Richard Realf and John Kagi, being civil officers. The next important event was the rescue by B. of certain slaves in Missouri who had been sold and were to be taken to Texas, one of the owners of the property being slain in the conflict. Again he went to Canada, returning to the United States in the summer. His attempt to capture the arsenal at Harper's ferry was made on Sunday night, Oct. 16th, 1859. The arsenal was easily seized, several citizens were taken into custody, conspicuous houses were searched for arms, and few of the citizens knew what was going on until mid-forenoon, when they began to rally; some scattered firing followed, one colored man was killed (by Brown's men), the mayor was slightly hurt, and so was one of Brown's sons. There was no sign of a rising of negroes, and before noon Brown and his men were in the arsenal, virtually prisoners. A feeling of rage prevailed so strongly, that a man who came from the arsenal with a flag of truce was instantly killed, and one prisoner was put to death. At night Brown had three unwounded whites and a few useless negroes for his army; one of his sons lay dead, and another was badly wounded. In the morning a force of United States marines arrived, and Brown, fighting desperately to the last, was taken prisoner, being wounded once with a sword, and twice with the bayonet. All of the invaders were indicted for conspiring to incite insurrection, and for murder and treason. After a trial of three days, in which Brown was unable, on account of his wounds, to stand up; he was found guilty, and sentenced to death on the scaffold within 48 hours. He died calmly on the 2d of Dec., 1859. It may safely be assumed that his execution hastened the downfall of slavery in the United States. B. was a man of stern and uncompromising moral principle; and though open to the charge of fanaticism, and regarded as justly and necessarily condemned to death under the law, he seems to be increasingly viewed as a martyr and a hero, offering himself in a blind and unconscious sacrifice as an obstacle in the path of a gigantic social and political wrong.

BROWN, John Newton, d.d., 1803–68; b. Conn.; a Baptist clergyman who published an *Encyclopædia of Religious Knowledge,* and *Memorials of Baptist Martyrs.*

BROWN, John Young. See page 880.

BROWN, Joseph E. See page 880.

BROWN, Nicholas, 1769–1841; b. R. I.; the chief patron of Brown university, which in 1804 changed its name in his honor from Rhode Island college. In early life he was a member of the house of Brown & Ives, successful merchants. The gifts of Brown to the university reached more than $100,000. He also gave $30,000 to establish an insane asylum in Providence, besides large sums to the athenæum, and to churches, etc.

BROWN, Robert, an English clergyman, founder of the sect of Brownists, b. in 1549, the son of Anthony Brown, esq., of Folthorp, Rutlandshire, was educated at Cambridge, and was at first a preacher at Bennet church, then a schoolmaster in Southwark, and a lecturer at Islington. In 1580, he began to attack the order and discipline of the established church, and soon after formed a distinct church on democratic principles at Norwich. Committed by Dr. Freake, bishop of that see, to the custody of the sheriff, he was released from prison through the influence of the lord-treasurer, Cecil, to whom he was nearly related. Having, in 1582, published a controversial work, entitled *The Life and Manners of True Christians*, with, prefixed, *A Treatise of Reformation without Tarrying for Any,* he was again arrested, but, through the lord-treasurer's intercession, again liberated. He afterwards formed several congregational churches; but, with many of his followers, was obliged to take refuge in Holland. In 1589, he returned to England, reconciled himself to the established church, and became rector of a church near Oundle, Northamptonshire. Of a very violent temper, he was, when 80 years old, sent to Northampton jail, for an assault on a constable, and died in prison in 1630. The Brownists continued, notwithstanding the defection of their leader, to subsist as a separate seet for some time both in Holland (among the English there) and in England. In the former country, they were at last absorbed in, or reconciled to, the Presbyterian church in 1701, in the latter, they may be said to have given birth to the Independents (q.v.), who rose into great importance in the 17th century.

BROWN, Robert, an eminent botanist, the son of an Episcopal clergyman, was b. at Montrose, Scotland, Dec. 21, 1773, and educated at Marischal college, Aberdeen. Having studied medicine at the university of Edinburgh, he became, in 1795, ensign and assistant-surgeon in a Scottish fencible regiment, with which he went to Ireland. Devoting himself to the study of botany, he resigned his commissions in 1800, and the following year was, on the recommendation of sir Joseph Banks, engaged as naturalist in the expedition sent out under capt. Flinders for the survey of the Australian coasts. On his return, in 1805, he brought home nearly 4000 species of Australian plants, a large proportion of which were new to science. Soon after, he was appointed librarian to the Linnæan society. To the *Transactions* of the Edinburgh Wernerian society and those of the Linnæan society, he contributed memoirs on *Asclepiadeæ and Proteaceæ,* and published *Prodromus Floræ Novæ Hollandiæ et Insulæ Van Diemen's,* vol. i. 1810; a supplement to this work appeared in 1830, relating to the *Proteaceæ* only. He also wrote the *General Remarks, Geographical and Systematical, on the Botany of Terra Australis,*

attached to the narrative of capt. Flinders' expedition, 1814. His adoption of the natural system of Jussieu, the French botanist, led to its general substitution in place of the Linnæan method. B.'s numerous memoirs in transactions of societies, and other contributions to botanical science, secured for universal approval the title conferred on him by Alexander von Humboldt of *Bottanicorum facile Princeps.* In 1810, B. received the charge of the library and splendid collections of sir Joseph Banks, which, in 1827, were transferred to the British museum, when he was appointed keeper of the botanical department in that establishment. In 1811, he was elected F.R.S.; in 1832, D.C.L. of Oxford; and in 1833 was elected one of the 18 foreign associates of the academy of sciences of the institute of France. In 1839, the royal society awarded him their Copley medal for his *Discoveries during a Series of Years on the Subject of Vegetable Impregnation.* He was president of the Linnæan society from 1849 to 1853. He died in London, June 10, 1858. A collected edition of B.'s works, in 5 vols. 8vo, has been published in Germany.

BROWN, SAMUEL, M.D., son of Samuel Brown (the founder of itinerating libraries, and grandson of the rev. John Brown of Haddington), was b. on the 23d Feb., 1817, and entered the university of Edinburgh in 1832. He took his degree as M.D. in 1839, and immediately surrendered himself to the magical fascination of chemistry. One idea possessed him to the close of his life—the possibility of reconstructing the whole science of atomics. He never, in spite of crushing failures in experiment, abandoned his early conviction that chemical elements, usually considered simple, might be transmuted into each other. In 1843, he delivered in Edinburgh four critical lectures on the atomic theory. During the same year, he became a candidate for the chair of chemistry in the university of that city; but having periled his claims on the experimental success of his fatal theory, and being again doomed to disappointment, he withdrew his application, and devoted himself with a kind of mournful austerity, and with more than the earnestness of a mediæval alchemist, to the solitary work of his laboratory. In 1850 appeared his *Tragedy of Galileo,* a volume which indicates, but does not embody, the finely imaginative and philosophical genius of its author. B. died of consumption 20th Sept., 1856. His fugitive essays were collected and published after his death; and, though for the most part too comprehensive in their intent, they enable the public to understand why he was held in admiration by men like Hamilton, Ferrier, De Quincey, Wilson, Carlyle, Hare, Jeffrey, and Chalmers.

BROWN, SAMUEL GILMAN, D.D., LL.D., b. Maine, 1813; graduated at Dartmouth college and Andover theological seminary; traveled in Europe; was professor in Dartmouth of oratory and intellectual philosophy; elected president of Hamilton college in 1867, and resigned the position in 1880. He has published a *Life of Rufus Choate; Biography of Self-Taught Men;* etc.

BROWN, SAMUEL R., D.D., 1810–80; b. Conn. His mother was the author of the familiar hymn, *I love to steal a while away.* The family removed in early childhood to Monson, Mass. Dr. B., as an American missionary, founded the first Protestant Christian school in China, at which Yung Wing, former member of the embassy from China to the United States, and chief of the educational commission which had 120 Chinese youths in New England schools and colleges, was educated. Graduated from Yale in 1832, Dr. Brown sailed for China, 1838, and was manager of the Morrison Chinese school for boys, at Canton, 1838–47. He was in the United States, 1847–59; and in 1859, was stationed at Yokohama, Japan, as one of the first missionaries. He is translator of the Bible into Japanese, and of several Japanese books; author of *Colloquial Japanese,* a grammar; *Prendergast's Mastery System,* adapted to the study of English or Japanese; and of many articles on Chinese and Japanese subjects. He returned to this country in feeble health, in 1879, and died in Monson, Mass.

BROWN, THOMAS, 1663–1704; recognized by Addison as "of facetious memory." He was a farmer's son, and entered at Oxford, but was obliged, for his wild conduct, to leave college. In London, after trying teaching, he wrote poems, letters, etc., for his bread. His works are witty, but coarse, and often indelicate. He would lose his friend sooner than his joke.

BROWN, THOMAS, a Scottish metaphysician, son of the Rev. Samuel Brown, was b. in 1778, at the manse of Kirkmabreck, Kirkcudbrightshire. After being some time at school in England, he went to Edinburgh in 1792, and for several years attended the lectures of Playfair, Black, Robison, and Dugald Stewart. He began the study of law, but shortly abandoned it for medicine; and having taken his diploma of M.D., in 1803, he became (1806) the partner of Dr. Gregory in his large practice. But his strong bent was for literature and philosophical speculation. At the age of 18, he had published a refutation of Darwin's *Zoonomia;* was a member of an academy of physics, or society for "the investigation of the laws of nature," formed in 1797, and embracing the names of Erskine, Brougham, Leyden, Jeffrey, Smith, and others; and contributed at the outset to the *Edinburgh Review.* In 1804, appeared his essay on *Cause and Effect,* in which he holds that there is nothing in a cause but the fact of immediate and invariable antecedence to the change called its effect. Dugald Stewart, professor of moral philosophy in the university, being obliged, from bad health, to retire in 1810, got Dr. B. appointed

assistant and successor, which office he continued to discharge till his death, in 1820. He was popular as a professor; and his *Lectures*, published after his death, have gone through a great many editions, though of late they have somewhat fallen out of notice. He also wrote a good deal of poetry, which is now forgotten. Dr. B. attempted to overturn the psychological system of his predecessors, Reid and Stewart, and to substitute a new and simplified scheme of mental phenomena. The greater part of this new philosophy was the production of his first session as professor, the writing of each lecture being begun on the evening previous to its delivery. A philosophic system thus improvised could not but be crude and inconsistent, however acute and imaginative its author might be. B.'s chief contribution to psychology is the establishment of a sixth or *muscular sense.*

BROWN, Ulysses Maximilian; 1705–57; after studying at Limerick, Rome, and Prague, he entered the Austrian army, serving with distinction in Corsica and Italy, and rising rapidly in rank. In 1739, he was field-marshal lieut., and one of the aulic council. He was field-marshal in the seven years' war, repulsed the Prussians at Lowositz, and was mortally wounded in the great battle of Prague.

BROWN, William, founder of the free public library at Liverpool, b. at Ballymena, Ireland, in 1784; was educated at Catterick, near Richmond, Yorkshire; and in his 16th year accompanied his parents to the United States. Employed in the counting-house of his father, who was engaged in the linen trade in Baltimore, in a few years he was admitted a partner. Returning to England in 1809, he established a branch of the business at Liverpool, and laid the foundation of one of the largest mercantile firms in the world. Embarking in the American trade, he became an extensive importer of cotton, and by his rare energy, quick business habits, and sterling integrity, soon became distinguished for the magnitude of his dealings. A liberal reformer, he took a prominent part in local and public affairs, and unceasingly promoted the education of the people. In 1844, he contested s. Lancashire upon the anti-corn-law league interest without success, but was returned to parliament for that division of the country in 1846, and was subsequently three times re-elected. A series of letters in defense of free-trade, which, in 1850, he contributed to the *Pennsylvanian* (Boston newspaper), attracted much attention. He was also an able advocate for the adoption of a decimal coinage. In 1857, he munificently subscribed £30,000 for the establishment of a free public library at Liverpool, and the noble building erected for the purpose owes its existence entirely to his generosity. He died in 1864.

BROWN, William Lawrence, 1755–1830; minister of the English church at Utrecht, and successor of his father and uncle. He was also professor of moral philosophy and ecclesiastical history in the university, to which was added a professorship of the law of nature. After the French revolution he escaped to England, and at a later period became principal of Marischal college, Aberdeen. In 1800, he was chaplain to the king, and in 1804 dean of the chapel royal. His best known works are *Essay on the Natural Equality of Man; On the Existence of the Supreme Creator;* and on the existing religions with regard to their moral tendency.

BROWN COAL, a mineral substance of vegetable origin, like common coal, but differing from it in its more distinctly fibrous or woody formation, which is sometimes so perfect that the original structure of the wood can be discerned by the microscope, whilst its external form is also not unfrequently preserved. In this state, it is often called *wood coal;* and it sometimes occurs so little mineralized, that it may be used for the purposes of wood, as at Vitry, on the banks of the Seine, where the wood-work of a house has been made of it. From this to the most perfectly mineralized state, it occurs in all different stages. It is often brown or brownish-black, more rarely gray. It burns without swelling or running, with a weaker flame than coal; emits in burning a smell like that of peat, and leaves an ash more resembling that of wood than of coal. Wherever it occurs in sufficient abundance, it is used for fuel, although very inferior to common coal. *Bovey coal,* so called from Bovey Tracey, in Devonshire, where extensive beds of it occur, and where it has long been wrought, is B. C., and often exhibits the woody structure very beautifully. B. C. occurs in a number of other places in Britain, and more abundantly near Paris, and in Liguria and Hanover, where it forms thick beds in alluvial deposits.—The *surturbrand* (q.v.) of Iceland is regarded as a variety of it. *Jet* (q.v.) is also sometimes regarded as a variety of brown coal. Although bearing the name coal, B. C. is rather a kind of *lignite* (q.v.) than of coal.

BROWNE, Charles Farrar, an American humorist, better known as "Artemus Ward," was b. in Waterford, Me., in 1836, and graduated from the free village school into a printing-office—the American boy's college. As a printer's boy, he worked in all the principal towns in New England, until settled at Boston, where he began to write comic stories and essays. A roving disposition carried him to the west, and he was engaged as local editor in Toledo, and later in Cleveland, Ohio, where his letters from "Artemus Ward, showman," a pretended exhibitor of wax figures and wild beasts, first attracted general attention. In 1860, he became a contributor to *Vanity Fair,* a New York comic weekly paper; and being invited to lecture, soon became very popular and attractive. As a lecturer, in 1863, he visited California, making the overland trip, visit-

ing Salt Lake City, the Mormon capital, and drawing crowds in every town he visited. In 1864, he opened his illustrated lectures on California and Utah in New York, with immense success; and in 1866, was induced to visit England, where he became a contributor to *Punch*, and gave his lecture on the Mormons in the metropolis, at the Egyptian hall, Piccadilly. But while convulsing crowded audiences with laughter, he was wasting with pulmonary disease. Early in 1867, he went to Guernsey for a milder air, but with no benefit; and was about to embark for America, when he died at Southampton, Mar. 6, 1867. He was tall, slender, with striking features, and a most amiable character, which attracted and attached to him many friends. By his will, after providing for his mother, leaving legacies to his friends, and his library to the best boy in the school of his native village, he left the bulk of his property in trust to Horace Greeley to provide an asylum for printers. His collected writings, which have had a wide circulation in America and England, are *Artemus Ward His Book; Artemus Ward among the Mormons; Artemus Ward among the Fenians;* and a posthumous collection and biography entitled *Artemus Ward in England.*

BROWNE, Edward Harold, D.D., an English bishop, b. 1811; educated at Cambridge, and holding various professorships until in 1864 he was consecrated bishop of Ely. He has published *An Exposition of the Thirty-nine Articles; Aids to Faith*, etc.

BROWNE, Hablot Knight. See page 880.

BROWNE, Isaac Hawkins, an English poet, 1705–60; educated at Cambridge; then engaging in the law. He was twice chosen to parliament; but his reputation rests exclusively upon his poems, such as *Design and Beauty*, and *The Pipe of Tobacco*, in which he imitates Cibber, Pope, Young, Swift, and others, all of whom were living when it was published. *De Animæ Immortalitate*, a close imitation of Lucretius, was his most important work.

BROWNE, John Ross, b. 1817; an emigrant from Ireland to the United States when a child. He learned shorthand writing, and became a reporter in the United States senate. Having a desire to travel, he went first on a whale-ship, and on his return published a book of observations in Zanzibar. He next went on government business to California in 1849. Two years later he went as correspondent of a newspaper to Europe, traveling through Italy, Sicily, and Palestine, and giving an account in *Yusef*. After further service in the north-western territories and on the Pacific coast, he went to Algeria, Iceland, Poland, and Russia, and published *The Land of Thor*, and *An American Family in Germany*. In 1869, he published an elaborate report on the *Resources of the Pacific Slope*. He was minister to China for a short time, appointed in 1868, but recalled two years later. He died in 1875.

BROWNE, Sir Thomas, antiquary and physician, was b. in London, 1605. His father, a merchant, left him an ample fortune, and he was educated at Winchester and Oxford. He began the study of medicine, then traveled over France and Italy, and after taking the degree of M.D. at Leyden, returned and settled (1636) at Norwich, where he continued to practice as a physician. He was knighted in 1671 by Charles II., and died 1682. His chief works are: *Religio Medici* (1642); *Inquiries into Vulgar and Common Errors* (1646); and a *Discourse on Sepulchral Urns* (1648). He wrote also *The Garden of Cyrus, or the Quincunxial Lozenge;* besides a variety of tracts, published after his death. His writings are highly prized by many for their genial fancy, pleasing quaintness of style, and varied erudition.

BROWNE, Thomas M. See page 880.

BROWNE, William, an English poet, b. 1590, of whose life little is known, save that he was in Exeter college, Oxford, and was a tutor to an earl of Caernarvon. He was of the school of Spenser, and author of *Britannia's Pastorals*, and *The Shepherd's Pipe.*

BROWNE, William George, 1768–1813; an English traveler, educated at Oxford. He visited Egypt and Sinai in 1793, and tried to go through Abyssinia. In 1800, and later, he traveled in Greece, Asia Minor, and Sicily. In 1812, he proposed to visit Samareand, and survey unexplored Central Asia. After leaving Teheran in 1813 he was no more heard from, save that the party were attacked by banditti and plundered and Browne was murdered. Thevenot, the French traveler, found and buried what he supposed were his bones.

BROWNELL, Henry Howard, 1820–72; b. Rhode Island; educated at Trinity college, Hartford, and intended for the bar, but devoted himself to teaching and authorship. In 1847, he issued a volume of poems, after which came *The People's Handbook of Ancient and Modern History; The Discoverers, Pioneers, and Settlers of North and South America*, etc. Near the close of the civil war he was acting ensign on admiral Farragut's staff, and after the war accompanied the admiral to Europe. In 1866 he issued in a volume *War Lyrics and other Poems.*

BROWNELL, Thomas Church, D.D., LL.D., 1779–1865; b. Mass.; graduated at Union college in 1804, where he was tutor and professor of chemistry and mineralogy. In 1810, he traveled in England and Ireland; and in 1816 was ordained a minister of the Protestant Episcopal church. In 1818 he was assistant minister of Trinity church in New York city, and in 1819 made bishop of Connecticut. It was under his care that Washington (now Trinity) college was founded, he being the first president. He was the author of *The Family Prayer Book*, and author and compiler of *Religion of the Heart and Life.*

BROWNIAN MOVEMENTS. The motion of non-living particles as seen through the microscope, often mistaken for motions of living matter. The cause of the movements has not been satisfactorily shown, but it has been surmised that heat is the motive power.

BROW'NIE, a domestic spirit of the fairy order in the old popular superstitions of Scotland. The common tradition respecting the B. is, that he was a good-humored drudging goblin, who attached himself to farmhouses and other dwellings in the country, and occupied himself during night, when the family were in bed, in performing any humble kind of work that required to be attended to, such as churning, thrashing corn, etc.—a spirit not seen or spoken to, and only known by the obliging performance of his voluntarily undertaken labors—a most valuable adjunct to the domestic establishment, and unfortunately no longer obtainable by good housewives. In Cornwall, a goblin known as *Browny* is evoked to assist at the swarming of bees (Borlace's *Antiquities of Cornwall*). The resemblance of the Scotch B. to the *Robin Goodfellow* (q.v.) of the English, and the *Kobold* of the Germans, is also so conspicuous that we must necessarily refer the different fragmentary legends on the subject to one of the old superstitions generally prevalent in Europe.

BROWNING, Elizabeth Barrett, England's greatest poetess, was b. in London about the year 1809. Her maiden name was *Barrett*. The culture which she received in her youth was of a kind far transcending the ordinary education even of "ladies intellectual." Classics, philosophy, and science were studied with enthusiasm and success. At a comparatively early period, she became a contributor to periodicals, and a series of articles on the Greek Christian poets indicated that she possessed both recondite learning and keen poetic insight. Her first important essay in authorship was a translation of the *Prometheus* of Eschylus in 1833. In 1838, appeared the *Seraphim, and Other Poems*, the external peculiarity of which was its endeavor to embody the ideas and sentiments of a Christian mystery in the artistic *form* of a Greek tragedy. Delicate health, arising from a rupture of a blood-vessel in the lungs, and the death by drowning of a favorite brother in the following year, compelled her to live in seclusion for a long time. At length her health was restored, and in 1846 she married Robert Browning (q.v.), himself a great poet. After their marriage, they resided chiefly in Italy, in whose welfare they were passionately interested. In 1850, Mrs. B. published her collected works, together with several new poems, among which was *Lady Geraldine's Courtship*. In 1851, appeared the *Casa Guidi Windows*, a poem whose theme was the struggle made by the Tuscans for freedom in 1849. *Aurora Leigh*, her longest production, was published in 1856. *Poems before Congress* appeared in 1860. Her poetry is distinguished by its depth of feeling, by its true pathos, by its noble and generous sentiments. Apparently she poured forth her verse with dangerous facility; and there are few of her poems which would not be improved by the simple process of curtailment. But there is not a thought or a sentiment of the many she has so beautifully expressed which any one would wish expunged. No writer ever exerted a better, gentler, happier influence. She died in 1861. Her son, Robert Barrett B., is an artist.

BROWNING, Orville H. See page 880.

BROWNING, Robert, a distinguished contemporary poet, b. in the neighborhood of London in the year 1812, and educated at the London university. The drama of *Paracelsus*, which first brought him into notice, was published in 1836. In the following year appeared his tragedy of *Strafford*, which was brought out upon the stage, but proved unsuccessful, though Macready himself personated the hero. *Sordello* and *The Blot in the Scutcheon* also failed, through lack of vivid and impressive incident. *Pippa Passes* secured a greater measure of popular approbation. In 1855, B. published *Men and Women*, one of his greatest works, containing poems which for depth and subtlety of conception, profound analysis of the human mind in its most delicate and impassioned conditions, and abstract speculative insight, are unsurpassed in the English language. If, as some think, in vigor and brilliancy of thought he is above Tennyson, he is as far beneath him in melody of versification and artistic beauty of style. Often he shows a morbid love of obscurity, but he frequently exhibits a Shakespearian clearness of idea and emphasis of expression. Some of his *Dramatic Lyrics* are faultless. Among his other poems are *The Ring and the Book; Balaustion's Adventure* (1871); *Prince Hohenstiel-Schwangau* (1871); *Red Cotton Night-cap Country* (1873); *Aristophanes' Apology* (1875); *The Inn Album* (1875); *Pacchiarotto, with other Poems* (1876); *La Saisiaz: The Two Poets of Croisic* (1878); Dramatic Idyls (1880); Agamemnon (1882); Ferishtah's Fancies (1884).

BROWNISTS, a sect of English puritans of the 16th c., who took their doctrines and name from Robert Brown. In 1592, sir Walter Raleigh estimated their numbers at 20,000. Harsh measures suppressed them in England, or drove them out; but the exiles found refuge in Holland, where their church included a number of eminent men. Ere long they divided into Brownists and Separatists, and soon the Brownists gave place to the Independents, or Congregationalists. The Brownists objected not to the doctrine, but to the form of government of the English church, and to that of the Presbyterians as well. They would join no other reformed church on account of the toleration of unregenerate persons as members, with whom they held it impiety to be in Christian fellowship. They condemned the wedding service in church, holding marriage to be a civil contract; refused the baptism of the children of those not church-members, or of

those who did not take sufficient care of their children already baptized, and rejected all forms of prayer, holding even that the Lord's prayer was presented as a model for imitation, not for repetition. Their form of church government was democratic, all power residing in the brotherhood. The churches were severally independent; the minister of one could not officiate in another. Lay brothers could prophesy or exhort, and it was usual after a sermon to question and discuss the topics broached. Every Brownist church was a perfect body corporate, possessing full power over its own members and acts, and accountable to no other jurisdiction whatever. The principles of this sect were those of a rude and extreme independency—the natural reaction from the ecclesiastical abuses of those times. Their leader, late in life, returned to the established church, becoming again a clergyman in it. His followers divided among themselves on some minor points of principle or of method, and the sect as a body came to nought. Yet those who favor "voluntaryism" in the church as against national establisment, and the sovereignty of the local congregation as against the consolidation of all the churches of some vast region, claim that the Brownist movement was the rough prophecy and heralding of a cardinal principle of polity then about to be restored to the church after ages of neglect.

BROWNLOW, William Gannaway, 1805–77; b. Va. He was bred to the carpenter's trade, but in 1826 became a Methodist minister, and was for 10 years an itinerant. He took part in politics, advocating the election of Adams in 1828. In 1837, he was editor of the *Knoxville Whig*, and his bold and quaint utterances soon gave him a wide reputation. In 1856, he defended the Methodist church in a work called *The Iron Wheel Examined and its Spokes Extracted.* Two years later, with Rev. A. Pryne of New York, he discussed the question, "Ought American Slavery to be Perpetuated?" Brownlow defended slavery. In the secession he clung to the union as the best means of upholding the institutions of the south. For this he was arrested by the confederate government and sent out of their lines. He returned to Tennessee in 1864, and the next year was elected governor, and in 1869 was sent to the United States senate. He was ardent, fearless, and resolute, caring little for refinement in speech or action.

BROWN PIGMENTS, a term in art applied to those substances in which the three primary colors unite in unequal proportions, red being in excess. B. P. are chiefly mineral, and are used sometimes in a raw but usually in a burned state. The most important are bister, asphaltum, umber, terra di sienna, Mars brown, Cassel earth, and brown madder.

BROWNS on porcelain are generally imparted by a mixture containing more or less sulphate of iron, and which, when heated, leaves the red oxide of iron (rust) on the porcelain, forming a more or less deep-tinted ochre. See Pottery.

BROWNS on cloth are communicated by arnotto (q.v.) and copperas, assisted by fustic, sumach, peachwood, logwood, and alum. See Dyeing.

BROWN-SEQUARD, Charles Edward. A French-American physiologist b. in Mauritius, 1818. His father, Edward Brown, was a native of Philadelphia; his mother was French, of the name of Sequard. He took the degree of M.D. at Paris, 1840, and afterwards spent much of his time in America, investigating and lecturing. His researches have been extensive, furnishing many of the most important facts in physiology, particularly in regard to the nervous system. It was formerly supposed that Longet had shown that the posterior columns of the spinal cord conducted sensation to the brain, while the anterior columns transmitted motor impulses to the muscles. Belingeri, however, in 1823, claimed to have demonstrated that sensation was conveyed to the brain by the gray substance of the cord only. These observations have been confirmed by Brown-Sequard, who was also the first to demonstrate that the decussation of the sensory conductors is in the cord itself; and he has the reputation of having created the physiology of the sensory tract of the spinal cord. His experiments upon the transfusion of blood are also of great interest. Detached muscular parts of animals, after losing their irritability, were revived for a considerable time by injecting fresh, oxygenated blood into them. A remarkable experiment was the transfusion, into the carotid artery of a dog just dead from peritonitis, of blood from a living dog. The dead dog was sufficiently restored to be able to stand upon his feet and wag his tail, and make other motions. He died a second time, twelve and a half hours after. Insufflation was also employed. In 1864 Dr. Brown-Sequard was appointed professor of physiology and pathology of the nervous system, in Harvard university. Returning to France in 1869, he was appointed professor of experimental and comparative physiology at Paris. He was founder and editor of the *Journal de la Physiologie de l' Homme et des Animaux* from 1858 to 1863. He established *Archives de la Physiologie Normale et Pathologique* in 1869. In 1873 he practiced medicine in New York, and with Dr. E. C. Seguin published the *Archives of Scientific and Practical Medicine.* He also published *Lectures on the Diagnosis and Treatment of the Principal forms of Paralysis of the Lower Extremities*, 8vo, London, 1861.

BROWNSON, Orestes Augustus, LL.D., 1803–76; b. Vermont; a theologian and author. He was at first a Presbyterian, but soon became a Universalist preacher, and was an indefatigable writer in support of whatever he for the time adopted. In 1828, he went into politics and tried to establish a workingmen's party in New York, moved thereto by the ideas of Robert Owen. In 1832, he was enthusiastic over Dr. Channing, and became a Unitarian preacher; in 1836, he organized in Boston "The Society of

Christian Progress," as a church of which he was pastor. About this time he published *New Views of Christianity, Society, and the Church*, which was a moderate attack on Protestantism. In 1838, he started the *Boston Quarterly Review*, which had existence for about five years, and was then merged in the New York *Democratic Review*. In 1840, he published *Charles Elwood, or the Infidel Converted*, a treatise in the form of a story, in favor of the Roman Catholic church, towards which the author was drifting, and which he joined in 1844. His literary labor was enormous, nearly all the original matter in his various reviews and magazines being from his own pen. Though so changeable in his early years, he seems to have found a final conviction in his late life; and he certainly gave to the Roman Catholic church a sincere and powerful advocacy.

BROWN SPAR, a name often given by mineralogists to certain varieties of dolomite (q.v.), or magnesia limestone, of not unfrequent occurrence, distinguished by a brownish or reddish color, and a pearly luster, upon account of which they are also sometimes called *pearl spar*.

BROWN'S TRACT. See page 881.

BROWNSVILLE, a t. in Fayette co., Penn., 30 m. s. of Pittsburgh; pop. '80, 1489. The village is on the Monongahela river, over which there is a large and expensive bridge. The river is navigable to this point.

BROWNSVILLE, a village in Haywood co., Tenn., on the Louisville and Memphis railroad, 57 m. n.e. of Memphis; pop. '70, 2454—1016 colored. There is a college for women under Baptist direction. The village is in a rich planting district, and has a good trade. 20,000 bales of cotton are shipped from here, yearly.

BROWNSVILLE, a city in Cameron co., Texas, on the Rio Grande opposite Matamoras (Mexico), 35 m. from the gulf; pop. '80, 4938. It is a port of entry, and has a considerable commerce. Fort Brown, near the city, is occupied by a United States garrison. B. contains a college, convent, custom house and several newspaper offices.

BROWN UNIVERSITY, at Providence, R. I., was organized in 1764, at Warren, in the same state, and removed in 1770 to its present location. It was known at first as Rhode Island college, but in 1804 the name was changed in honor of Nicholas Brown, one of its most munificent benefactors. It has been from the beginning under Baptist direction and patronage, but it is not sectarian in its teaching. It has an endowment of $775,000, and an annual income of $65,000. Its property is valued at over $1,250,000. The college buildings, five in number, stand upon elevated ground, and are inclosed in a campus of 16 acres, beautifully graded and adorned with trees, chiefly elms. The library, a choice and admirable selection, contains 55,000 volumes and 17,000 pamphlets; and a permanent fund of $27,000 insures its constant increase. The museum of natural history contains a valuable collection of specimens. There are (1880) 14 professors, 5 other teachers, and 260 students. The alumni number 2845. Mr. James Manning was the first president, Rev. Jonathan Maxey the second, and Rev. Asa Messer the third. The latter was succeeded in 1827 by Rev. Francis Wayland, D.D., one of the most eminent of American divines and educators, under whose direction the institution greatly prospered. His successors have been Barnas Sears, D.D., LL.D., 1855–67; Alexis Caswell, D.D., LL.D., 1867–72; and the present incumbent, E. G. Robinson, D.D., LL.D., appointed in 1872. A fund of $50,000, created by the state, sustains 30 scholarships. More than 60 other scholarships, each yielding about $60 per annum, have been established; and there is an arrangement whereby $25 is annually deducted from the tuition of a number of indigent students, not exceeding two fifths of the whole body.

BRSHESI'NY, an insignificant t. of Poland, in the government of Piotrkov, 62 m. s.w. of Warsaw, near the railway that connects Warsaw with Vienna and other places. Pop. '67, 6040.

BRUCE, a co. in n.w. Ontario, Canada, on lake Huron; 1600 sq.m.; pop. '81, 64,774. There is a coast line of 130 m. in the n.w. part of the county, forming a long peninsula between the lake and Georgian bay. Vast beds of salt underlie the coast along the lake. In the s. part the soil is level and fertile. Capital, Walkerton, on Saugeen river.

BRUCE, Blanch K. See page 881.

BRUCE, the surname of a family illustrious in Scottish history, descended from Robert de Bruis, a Norman knight, who accompanied William the conqueror to England in 1066, and died soon after. His younger son, Adam, who acquired large possessions in Yorkshire, left a son, Robert de Brus of Cleveland, a companion in arms of prince David of Scotland, afterwards David I., from whom he received a grant of the lordship of Annandale, held by the tenure of military service. At the commencement of the war in England between Stephen and Matilda, niece of the king of Scots, Robert de B. adhered to the former, and renounced his allegiance to David, resigning his lands in Annandale to his son Robert. In 1138, he was sent by the barons of the north of England to negotiate with David, who had advanced in support of his niece's claims as far as Northallerton, Yorkshire. In the battle of the Standard which followed, he took prisoner his son Robert, then 14 years of age, who, as lord of Annandale, fought on the Scottish side. He died in 1141. His English estates were inherited by his eldest son, Adam, whose male line terminated in Peter de B. of Skelton, constable of Scarborough castle in 1271. Robert de B., 2d lord of Annandale, had two sons: Robert—who married a natural

daughter of William the lion, and died, without issue, before 1191—and William, whose son, Robert, 4th lord of Annandale, married Isobel, 2d daughter of David, earl of Huntingdon and Chester, brother of William the lion, and thus laid the foundation of the royal house of Bruce. He died in 1245.

BRUCE, David, son of king Robert Bruce, succeeded his father, in 1329, as David II., when only 5 years old. In terms of the treaty of Northampton, he had married, when 4 years old, Joanna, daughter of Edward II. of England, and on 14th Nov., 1331, he was crowned with her at Scone. In 1333, the success of Edward Baliol and the English party obliged David's guardians to send him and his consort to France; but on the dispersion of Baliol's adherents, David returned to Scotland in 1341. He made three unsuccessful inroads into England, and on a fourth invasion, in 1346, was taken prisoner at the battle of Neville's Cross, near Durham, and conveyed to the tower of London. Thence he was removed to Odiham, in Hampshire, and not released till 1357, when his ransom was fixed at 100,000 marks. His queen dying in 1362, he married Margaret Logie, a Scottish gentlewoman of singular beauty, whom he divorced in 1370. He had no issue; and in his latter years, he was engaged in several intrigues with England, with the view of excluding his nephew, Robert, the steward of Scotland, the next heir, from the throne. He died at Edinburgh castle, Feb. 22, 1371.

BRUCE, Edward, king of Ireland, brother to the above, a chivalrous but rash and impetuous prince, was actively engaged in the struggle for Scotland's independence; and in 1308, after defeating the English twice, made himself master of Galloway. In 1315, the chieftains of Ulster tendered to him the crown of Ireland, on condition of his assisting them to expel the English from the island. With a small army of 6000 men, he embarked at Ayr, and reached Carrickfergus, May 25th of that year, accompanied by sir Thomas Randolph, earl of Moray, sir John of Soulis, sir John the Stewart, sir Fergus of Ardrossan, and other Scottish knights of renown. His rapid victories soon made him master of the province of Ulster, and he was crowned king of Ireland, May 2, 1316, but was slain at the battle of Dundalk, Oct. 5, 1317.

BRUCE, George, 1781–1866; b. Scotland, came to Philadelphia in 1795 as a printer, and in 1803 became publisher of the *New York Advertiser.* In 1812, he and his brother introduced the art of stereotyping, and followed that and type-founding thereafter. One of the nephews was the inventor of a machine for casting types.

BRUCE, James, a celebrated traveler, born at Kinnaird house, Stirlingshire, Dec. 14, 1730, was the eldest son of David Bruce, esq., of Kinnaird, and Marion Graham of Airth. Educated at Harrow, he was sent, in the winter of 1747, to the university of Edinburgh, with the intention of studying law; but changing his views, he went to London, and having, in Feb., 1754, married the daughter of a wine-merchant's widow, became a partner in the business. His wife dying within a year, he made a tour on the continent, and on his father's death in 1758, he succeeded to the estate of Kinnaird. In 1761, he retired from the wine-trade, and in 1763 was appointed consul-general at Algiers. He remained there about two years, studying the oriental languages, and acquiring the rudiments of surgery. He then went to Aleppo, where he took further instructions in the medical art, being resolved to travel in the character of a physician. In June, 1768, he proceeded to Alexandria and from Cairo set out on his famous journey to Abyssinia, which forms an epoch in the annals of discovery. Sailing up the Nile to Syene, he crossed the desert to Cosseir, and arrived at Jeddah in April, 1769. After various detentions he reached Gondar, the capital of Abyssinia, in Feb., 1770; and on Nov. 14 of that year, succeeded in reaching the sources of the Abawi, then considered the main stream of the Nile. This accomplishment of the chief object of his journey filled him with the greatest exultation. He remained about two years in Abyssinia, and returning by way of Sennaar and the desert of Assouan, after great hardship reached Alexandria, whence he embarked, Mar., 1773, for Marseilles. In France he spent a considerable time, visiting the celebrated count de Buffon, and other distinguished men, and in 1774, he returned to Scotland. In 1776, he married Mary, daughter of Thomas Dundas, esq., of Fingask, by whom he had two sons and one daughter. His long-expected *Travels to Discover the Sources of the Nile, in the Years* 1768–73, were published in 1790, in 5 large 4to vols. with plates and charts. The work contained such curious accounts of the manners and habits of the people of Abyssinia, that it startled the belief of many, and some of them were set down as fabrications. Among other doubters were De Tott in France, and Dr. Johnson in England. Modern travelers, including Salt, Pearce, Burckhardt, Belzoni, and others, have, however, fully confirmed his statements. B. died April 27, 1794, at Kinnaird, of a fall down stairs.

BRUCE, Michael, a minor Scottish poet, the son of a weaver, b. at Kinnesswood, Kinross-shire, Scotland, Mar. 27, 1746, was, in his younger years, employed as a herd-boy. In 1762, he was sent to Edinburgh University to study for the ministry, and when not at college, was engaged as a village schoolmaster. He had all his life to struggle with poverty, and his frame being weak, melancholy took possession of his mind, and his constitution began visibly to decline. He died of consumption, July 6, 1767, aged 21. His poems, few in number, and of a tender and pathetic description, were published by the rev. John Logan, his fellow-student and associate at college, at Edinburgh in 1770. His last composition was a touching elegy on his own approaching death.

BRUCE, ROBERT, the most heroic of the Scottish kings, was b. Mar. 21, 1274. In his youth he favored the English interests, in the expectation, doubtless, of his father being preferred to the Scottish throne. In 1296, as earl of Carrick, he swore fealty to Edward I. at Berwick, and the following year he renewed his oath of homage at Carlisle. Shortly after, he abandoned the cause of Edward, and, with his Carrick vassals, joined the Scottish leaders in arms for the independence of their country. On the defeat of the Scots, a few months afterwards, at Irvine, B. made his peace with the English monarch. After Wallace's defeat at Falkirk, B. burned the castle of Ayr to the ground, to prevent its falling into the hands of the English, and retired into the recesses of Carrick. In 1299, the year after Wallace had resigned the regency, B., then in his 25th year, was admitted one of the four regents, who ruled the kingdom in the name of Baliol. In the three campaigns which subsequently took place, previous to the final subjugation of Scotland, B. continued faithful to Edward, and in 1305 was consulted in the settlement of the government. With John Comyn, called the Red Comyn, the nephew of Baliol, he appears to have entered into some agreement as to their rival claims to the throne. In an interview between them, in the church of the Minorite Friars, Dumfries, Feb. 4, 1305–06, a quarrel took place, and B., in a paroxysm of passion, stabbed Comyn with his dagger. Rushing out to his attendants, he exclaimed: "I doubt I have slain the Red Comyn." "You doubt!" cried one of them; "I mak sikker!" (i.e., sure), and, running into the church with some others, slew Comyn and his brother, who attempted to defend him. B. hastened to Lochmaben castle, assembled his vassals, and asserted his right to the throne. Two months after (Mar. 27), he was crowned king at Scone. An English army, under the earl of Pembroke, nominated by Edward governor of Scotland, took possession of Perth, and on the night of the 18th June, attacked B. in the wood of Methven, compelling him to retreat into the wilds of Athole. At Dalry, near the head of Loch Tay, B. was attacked by Alexander, lord of Lorn, chief of the Macdougals, husband of the aunt of the Red Comyn, and compelled to retire. Sending his queen and her ladies to Kildrummie castle, Aberdeenshire, under the charge of Nigel Bruce and the earl of Athole, he, with 200 followers, crossed Loch Lomond, and had recourse for subsistence to the chase. B. next took refuge in the little island of Rathlin, on the n. coast of Ireland, where he remained all winter, and was supposed to be dead. In his absence, the English took the castle of Kildrummie, hanged Nigel Bruce and other chiefs who had defended it, and tore the queen and princess Marjory from the sanctuary of St. Duthac, Ross-shire. All B.'s estates were confiscated, and himself and adherents excommunicated by the pope's legate at Carlisle. In the spring of 1307, with about 300 men, B. landed in Carrick, and at midnight surprised the English garrison in his own castle of Turnberry; but before a superior force he retired into the mountainous districts of Ayrshire. At Loudon hill, May 10, 1307, he defeated the English under the earl of Pembroke, and, three days after, overthrew another party under the earl of Gloucester. In less than two years he wrested from the English nearly the whole of Scotland. His authority being now established, in 1309 B. advanced to Durham, laying waste the country. The same year, Edward II. of England invaded Scotland, but was compelled to retreat from Edinburgh to Berwick-upon-Tweed. In the harvest of 1312, the Scots again invaded England, but unsuccessfully. B. now reduced the Isle of Man also. On his return, in the autumn of 1313, he found his brother, Edward Bruce, engaged in the siege of Stirling castle, held by sir Philip Mowbray for the English. A treaty was entered into, by which Mowbray bound himself to surrender it, if not relieved before 24th June following. This led to the memorable battle of Bannockburn, 24th June, 1314, at which B. commanded in person. The English, under Edward II., amounting, it is said, to about 100,000 men, were totally routed, leaving 30,000 dead upon the field; while the Scots, numbering only 30,000, and 15,000 camp-followers, lost about 5000. In 1317, B. passed over to Ireland, to assist his brother, Edward, elected king of that country, and defeated the Anglo-Irish under the baron of Clare; and in the spring of 1318 the Scots army invaded England by Northumberland. Another invasion of Scotland by the English king, who was compelled to retreat, was followed by B. again marching into England. After besieging Norham castle, he defeated Edward once more at Biland abbey, Yorkshire. A truce was, in consequence, ratified between the two kingdoms at Berwick, June 7, 1323, to last for 13 years. On the accession of Edward III., in 1327, hostilities recommenced; and the Scots being again victorious, a final treaty was ratified in a parliament at Northampton, Mar. 4, 1328, recognizing the independence of Scotland, and B.'s right to the throne. His warfare was now accomplished, and, suffering under the disease of leprosy, he spent the last two years of his life at Cardross castle, on the northern shore of the firth of Clyde. He died June 7, 1329, in his 55th year, and the 23d of his reign. His heart, extracted and embalmed, was delivered to sir James Douglas, to be carried to Palestine and buried in Jerusalem. Douglas was killed fighting against the Moors in Spain, and the sacred relic of B., with the body of its devoted champion, was brought to Scotland, and buried in the monastery of Melrose. B.'s body was interred in the abbey church of Dunfermline; and, in clearing the foundations for a third church on the same spot in 1818, his bones were discovered. He was twice married: (1) to Isabella, daughter of Donald, tenth Earl of Mar—issue, a daughter, Marjory, wife of Walter the high steward, whose son ascended the throne as Robert II.; and (2) to Elizabeth, daugh-

ter of Aymer de Burgh, earl of Ulster—issue, one son, who succeeded him as David II., and two daughters.

BRUCE, Robert de, fifth lord of Annandale, son of the fourth lord above mentioned, and the competitor with John Baliol for the crown of Scotland, was b. in 1210. On the death of his mother, the princess Isobel, in 1252, he did homage to Henry III. for her lands in England, and in 1255 was made sheriff of Cumberland, and constable of the castle of Carlisle. About the same time he was appointed one of the fifteen regents of Scotland, in the minority of Alexander III. In 1264, he led, with Comyn and Baliol, the Scottish auxiliaries to the assistance of the English monarch at the battle of Lewes, where he was taken prisoner, but released after the battle of Evesham, the following year. On the Scottish throne becoming vacant at the death, in 1290, of Margaret, the "maiden of Norway," granddaughter of Alexander III., Baliol and Bruce claimed the succession, the former as great-grandson of David, earl of Huntingdon, by his eldest daughter, Margaret; the latter as grandson, by his second daughter, Isobel. Edward I. of England, to whom the dispute was referred, decided in favor of Baliol, 19th Nov., 1292. To avoid swearing fealty to his successful rival, B. resigned Annandale to his eldest son, Robert de B., earl of Carrick. He died at his castle of Lochmaben, Dumfriesshire, in 1295, leaving three sons and a daughter.

BRUCE, Robert de, earl of Carrick, eldest son of the preceding, accompanied king Edward I. of England to Palestine, in 1269, and was ever after greatly esteemed by that monarch. On his return to Scotland, he married in 1271, Martha Margaret, countess of Carrick, and in her right became earl of Carrick. Following the example of his father, to avoid doing homage to Baliol, he resigned the lordship of Annandale to his eldest son, Robert, the future king of Scotland, then a minor. Retiring to England, he was, on the death of his father, in 1295, appointed constable of the castle of Carlisle; and in the following year, when Baliol renounced the authority of Edward, and, assisted by the Comyns, had recourse to arms, B. fought on the side of the English. After the battle of Dunbar, in which the Scots were defeated and Baliol compelled to relinquish the sovereignty, he made application to Edward for the vacant crown, but was refused it. He died in 1304.

BRU'CEA, a genus of shrubs somewhat doubtfully referred to one or other of the allied natural orders *rutaceæ* (q.v.), *simarubaceæ* (q.v.), and *xanthoxylaceæ* (q.v.).—*B. antidysenterica*, or *ferruginea*, is an Abyssinian species, the leaves of which are said to be tonic, astringent, and useful in dysentery. Those of *B. Sumatrana*, a native of the Indian archipelago, China, etc., possess the same medicinal properties. They are intensely bitter.—The Abyssinian species acquired a factitious importance in the beginning of the 19th c., from a mistaken belief that it produced the dangerous false Angostura bark (see Angostura Bark), and in this belief the name *brucine* (q.v.) was given to an alkaloid really produced by the nux vomica (q.v.) and other species of *strychnos* (q.v.).

BRUCH, Max. See page 881.

BRUCHSAL, a t. of the grand duchy of Baden, situated on the Salzbach, and on the railway between Heidelberg and Carlsruhe, 12 m. n.e. of the latter place. B., which is a place of considerable antiquity, has three suburbs. The old castle of the prince-bishops of Speier, who took up their residence here early in the 11th c., is still standing, and in the church of St. Peter are some ancient tombs. B. has two prisons organized on a modified form of the Pennsylvanian system. Pop. '75, 10,810, who were chiefly engaged in the wine trade.

BRU'CINE is one of the alkaloids (q.v.) present in *strychnos nux vomica* along with strychnine, etc. It is not so abundant as the strychnine, nor is it so poisonous. It is mainly characterized by giving a blood-red color with concentrated commercial nitric acid, and, indeed, the red color always yielded by nux vomica, and occasionally by strychnine when treated with nitric acid, is due to the presence of brucine.

BRUCITE, a native magnesic hydrate, found in serpentine in New Jersey, and in the chrome mines in Texas. Syn. MgH_2O_2.

BRÜCKENAU, a village of Bavaria, on the Sinn, 36 m. n.e. of Würzburg. It is famous in connection with the baths of B., which are picturesquely situated in a beautiful part of the valley of the Sinn, about 2 m. w. from the village. The grounds are tastefully laid out in gardens, and charming walks traverse the surrounding woods. The place is a favorite summer-resort of the Bavarian court. B. has paper-mills. Pop. '71, 1669.

BRUCKER, Johann Jakob, a German theologian and historian, 1696–1770. He was educated at Jena, where he took the degree of A.M. in 1718, and the next year published *Tentamen Introductionis in Historiam de Ideis.* In 1723 came *De Vita et Scriptis Cl. Etringeri*, and in 1731 he was chosen a member of the Berlin academy of sciences. Thence he went to Augsburg as pastor of the church of St. Ulric, where he published dissertations on the history of philosophy, and still later a history of philosophy in dialogue form. In 1741 came the first volume of his great work on the critical history of philosophy, completed in 1744, a work that had an immense success. He wrote many other works on philosophical subjects, and superintended and corrected an edition of Luther's translation of the New Testament, but did not live to complete it.

BRÜGES (Ger. *Brügge*), a city of Belgium, capital of the province of West Flanders, is situated in a fertile plain about 8 m. from the sea, with which it is connected by the three canals from Ghent, L'Ecluse, and Ostend, the latter admitting the largest sea-going ships. Lat. 51° 12′ n., long. 3° 14′ e. B. derives its name from its many bridges, all opening in the middle to admit of the passage of vessels. The ramparts surrounding the city are an agreeable promenade. The streets have a venerable and picturesque appearance, but they are greatly deserted, the population of the city being now scarcely a quarter of what it was during the middle ages. Among the most interesting buildings are the town-hall, with a lofty tower and a celebrated set of 48 bells; a Gothic senate-house, built about the close of the 14th c.; a court of justice, containing a famous carved chimney-piece of the date 1559; the church of Notre Dame, with its spire 450 ft. high, its many valuable paintings, and a statue of the Virgin (said to be by Michael Angelo), for which Horace Walpole offered 30,000 florins, and its splendid monuments of Charles the Bold and his daughter Mary, wife of the emperor Maximilian; the cathedral of St. Sauveur, not remarkable for its exterior, but containing paintings by eminent masters; St. John's hospital, with celebrated pictures by Memling, etc. The academy of painting contains several fine pictures by J. van Eyck. B. has manufactures of woolen, linen, cotton, lace, leather, cordage, and tobacco; and distilleries, sugar and salt refineries, and ship-building yards. Railways connect B. with Ostend, Ghent, and other cities of Belgium and the continent. Pop. '76, 45,097, of whom nearly a third are paupers. B. is a very ancient city. Here, it is said, St. Chrysolus preached the gospel as early as the 3d century. In the 7th c., B. was the capital of the surrounding district called Flanders, and before the conquest of England by the Normans, its commercial importance was established. In the beginning of the 13th c., it was the central mart of the Hanseatic league; and in the following century it may be said to have become the metropolis of the world's commerce. Commercial agents from 17 different kingdoms resided here, and no less than 20 ministers from foreign courts had mansions within its walls. Its population at this time amounted to upwards of 200,000. In 1488, the citizens rose in insurrection against the archduke Maximilian, and with the harsh measures of repression which ensued, commenced the commercial decline of Brüges. Many of the traders and manufacturers, driven forth from their own country, settled in England, and from this time may be dated the beginning of English manufacturing superiority. In the 16th c., however, the tapestry of B. was still celebrated throughout Europe, and the famous Gobelin tapestry of Paris is said to owe its origin to a manufacturer of Brüges. The city was taken by the French in 1794, and soon after incorporated with the French empire; but in 1815 it became a part of the kingdom of the United Netherlands, and in 1830 of the Belgian monarchy.

BRUGG, or Bruck, a village of Switzerland, in the canton of Aargau, on the right bank of the Aar, and near the mouth of the Reuss, about 9 m. n.e. of Aarau. It is interesting as occupying a part of the site of the ancient *Vindonissa*, the strongest fortress, as well as the most important settlement of the Romans in Helvetia; and also as the cradle of the house of Hapsburg, to whom, in early times, it belonged. The remains of the castle of Hapsburg, founded by count Radbod of Altenburg in 1020, are still to be seen on a wooded height, about 2 m. from the village. Nearer, is the abbey of Königsfelden, founded in 1310 by the wife and daughter of the emperor Albert, who, two years before, was murdered on the spot by his nephew and others, for which a terrible revenge was taken on the relatives of the murderers. In the vaults beneath the abbey are interred many of the members of the Austrian royal family. High conical-roofed towers guard the exit and entrance to B., which has a pop. of (1870) 1338. Zimmerman was a native of this place.

BRUGMANS, Sebaldus Justinus, 1763–1819; a Dutch naturalist and physician, professor of philosophy and physical sciences at Franeker, Holland, where he founded a museum of comparative anatomy. He organized and became chief director of the sanitary institutions of Holland. He improved the condition of military hospitals, and by his effort the 20,000 soldiers wounded at Waterloo were properly cared for. In 1815, he was at the head of the sanitary service of the army and navy. Many of his papers on medical science and natural history have been published.

*BRUGSCH, Heinrich Karl, ph. d., b. 1827; a German Egyptologist, and director of the Egyptian museum in Berlin. He made two visits to Egypt for archæological purposes, and was a member of the Prussian embassy to Persia in 1860. In 1864, he founded at Leipsic a periodical devoted to Egyptian archæology. At Gottingen he was professor in 1868–70, when he became director of an Egyptological school at Cairo. He has published several important works on Egyptian subjects, one especially interesting, on the Biblical story of the crossing of the Red sea, advancing a theory quite different from that long accepted as to the place of that event. He assigns the crossing by the Israelites and the ingulfing of the Egyptians to the vast morass near the shore of the Mediterranean, and occasionally inundated by its waves driven by a strong wind. His evidences of this show ingenuity and learning, but have not commanded the general assent of scholars. See *Supp.*, page 881.

BRÜHL, a t. of Rhenish Prussia, about 9 m. s.s.w. of Cologne, on the railway to Bonn. It is surrounded by old walls, and has a splendid château, erected in the early

part of the 18th c. by the elector Clement Augustus of Bavaria. There is also an ancient Franciscan convent, now converted into a seminary for Roman Catholic schoolmasters. After his banishment from France in 1651, cardinal Mazarin took up his residence in Brühl. Pop. '75, 3499.

BRÜHL, Heinrich, Count von Bruhl, prime-minister of Augustus III., king of Poland, and elector of Saxony, deserves a place in history as a signal example of an unworthy minister and venal statesman. He was born in 1700, at Weissenfels, and in early life entered, as a page, into the service of the duchess of Sachsen-Weissenfels. His winning address and tact gained for him rapid promotion through several offices of state, until, in 1747, he became prime-minister to that idle and unpatriotic ruler, Augustus III. Never was a ruler more slavishly obeyed by a statesman. B. would follow the prince, as he strolled about smoking, without speaking a word for a whole day; or, when his majesty lazily inquired: "Brühl, have you any money for me?" "Yes, sire," would be the constant reply; but in order to be able to give this answer as frequently as it was demanded, B. drained the coffers of the state, and burdened the country with debt. He, however, contrived to enrich himself, and to accumulate honors and titles. By Elizabeth of Russia, he was invested with the order of St. Andrew, and by Charles VI. of Austria, he was made a count of the empire. He kept 200 servants, paid his body-guard better than Augustus did his, furnished the costliest table, possessed the finest wardrobe, and, in short, maintained the most splendid establishment in the kingdom. "Of all statesmen," said Frederick II., "Brühl has collected the greatest quantity of fine clothes, watches, lace, boots, shoes, and slippers!" The effect of B.'s reckless robbery of the national finances to gratify the dissolute Augustus and himself, made itself felt at the outbreak of the seven years' war, when the country could only furnish 17,000 men to oppose Frederick of Prussia, who surprised and captured the whole Saxon army in its camp at Pirna. Augustus and B. fled to Warsaw. When peace was concluded, they returned to Dresden, where Augustus died on the 5th Oct., 1763, and was followed by his worthless parasite, 28th October. B.'s palace is still one of the principal buildings in Dresden, and his library of 62,000 vols. forms a chief part of the royal library, Dresden.

BRUISE, or Contusion, signifies an injury inflicted by a blow or sudden pressure, in which the skin is not wounded, and no bone is broken or dislocated. Both terms, and especially the latter, are employed in surgery to include all such injuries in their widest range, from a black eye to a thoroughly crushed mass of muscle. In the slighter forms of this injury, as in ordinary simple bruises, there is no tearing, but only a concussion of the textures, the utmost damage done being the rupture of a few small blood-vessels, which occasions the discoloration that is always observed in these cases. In more severe contusions, the subjacent structures—muscles, connective tissue, vessels, etc.—are more or less ruptured, and in extreme cases, are thoroughly crushed, and usually become gangrenous. The quantity of blood that is extravasated mainly depends upon the size and number of the ruptured blood-vessels, but partly also on the nature of the textures of the injured part. Thus, a lax tissue, as that of the eyelids, favors the escape of blood into the surrounding parts. Moreover, the constitution of the patient has some influence, and many persons, especially (according to Mr. Paget, in his article on "Contusions" in Holmes's *System of Surgery*, vol. i.) pallid, fatty, soft-skinned women, though suffering from no apparent disease, are subject to extravasations, and consequently to discolorations, very disproportionate to the injuries that cause them.

The most characteristic signs of a recent contusion are more or less shock (q.v.), pain, swelling, and discoloration of the surface from effused blood (commonly known as *ecchymosis*, q.v.). There is nothing special in the character of the shock, but it is worthy of notice that it is most severely felt in injuries of special parts—as the testes, the breasts, and the larger joints, which are often followed by remarkable general depression, faintness, loss of muscular power, and nausea. The immediate pain following the blow is succeeded by a feeling of numbness, which, after a varying time, unless the part is killed, gives place to a heavy, aching pain. Although some depression may usually be observed immediately after the infliction of the blow, swelling of the parts rapidly follows, as may be well seen in the case of a child receiving a blow on the head, or of the wale that rises after the lash of a whip. In lax parts, such as the eyelids, the swelling is often considerable, and may remain for a week or more; but in other parts, it usually subsides in two or three days. The discoloration of the skin consequent on blows is of a more or less purple tint, varying from black to crimson or pink. "Blackness," says Mr. Paget (*op. cit.*), "usually indicating intense injury, is probably due to the extravasation of a large portion of entire blood; crimson or pink tints, to the prevalence of a blood-stained fluid; blue, to the degrees in which blackness is veiled by the cuticle and skin, as the color of blood in veins is; and perhaps some of the shades of pink to the partial aëration of the blood by the penetration of air through the epidermis. After a variable time, proportionate to the severity of the injury, these colors fade out, passing most commonly through gradually lightening shades of brownish olive, green, and yellow." The causes of these changes of color are not clearly known; as, however, the changes are not observed in bruises of parts removed from air and light, they are probably due to oxidation and actinic agency. When a severe B. tends to a natural

cure, and there is no inflammation or sloughing, the effused blood is generally absorbed, the liquid portion rapidly disappearing, while the blood-cells are more slowly removed. In some cases, it is probable that the effused blood becomes organized into vascular connective tissue, which takes part in the repair of the injured tissue. We need not follow the course of a B. in which active inflammation with suppuration ensues, or in which sloughing takes place, as these complications must be treated according to the ordinary rules of those affections. There are, however, one or two ill consequences following partial recovery, which require notice. Thus, in some organs, as the breast, abscess may ensue long after a blow; or a sensitive indurated lump may remain; or (more commonly) there may be long-continued pain, without change of texture; or, lastly, cancer may ensue. Blows on superficial bones, as those of the skull, are not unfrequently followed by very painful thickening of the periosteum; and a muscle violently struck may be paralyzed, and rapidly waste away; and constitutional diseases, such as gout and rheumatism, are well known to localize themselves with special severity in parts that have once been seriously bruised.

With regard to treatment, simple and not very severe bruises require little treatment but the rest necessary for the avoidance of pain; but the removal of the swelling and discoloration may be hastened by the application of various local stimulants, which seem to act by accelerating the circulation through the bruised part, and promoting the absorption of the effused fluid. Friar's balsam, compound soap liniment, or poultices made with the roots of black bryony beaten to a pulp, are popular remedies of this class. Mr. Paget regards the tincture of arnica as the best application. Where the skin is thick, it may be gently rubbed over the bruised part in an undiluted state; where the skin is thinner, it should be mixed with an equal bulk of water; or, which is probably better, it may be constantly applied as a lotion if diluted with five or six parts of water. Pugilists, who are probably better acquainted with ordinary bruises than any other class of men, are in the habit of removing the swelling of the eyelids that often naturally occurs during a prize-fight, to such an extent as to close the eyes, by at once puncturing the eyelids at several points with a lancet; and their favorite remedy for a black-eye or other B. on the face is a fresh beef-steak applied locally, as a poultice. Bruises of a more severe nature, as when there is much breaking or crushing of the tissues, must, of course, at once be placed in the hands of a surgeon.—For further details on this subject, the reader is referred to Mr. Paget's excellent article, from which we have freely quoted.

BRULÉ : co. Dak. See page 881.

BRUMAIRE (Lat. *bruma*, winter), a division of the year in the republican calendar of France. It includes the time from Oct. 22 to Nov. 20. The celebrated 18th B., which witnessed the overthrow of the directory and the establishment of the sway of Napoleon, corresponds with Nov. 9, 1799, of the Gregorian calendar.

BRUMATH, or Brumpt, a t. of Lower Alsace, on the Zorn; pop. '71, 5619. It has a castle and mineral wells, and is on the site of the ancient Brucomagus.

BRUMIDI, Constantine, 1805–80; a native of Rome, Italy, son of a Greek father and an Italian mother, widely known as a fresco painter. He was educated in the college of fine arts at Rome, and came to the United States in 1852. His first work, "The Crucifixion," was in St. Stephen's church in New York. Thence he went to Philadelphia and to the city of Mexico, at both places employing himself in church decoration. In 1854 he arrived in Washington, and was at once employed on the bare walls and ceilings of the national capital, the rotunda of which contains many fine pieces from his hand, combining mythology, allegory, and history. There are cartoons of his yet to be put in place, but by other hands, including "Oglethorpe and the Indians," "The Battle of Lexington," "Surrender of Cornwallis," "Decatur at Tripoli," "The Death of Tecumseh," "Entrance of General Scott into Mexico," and "The Discovery of Gold."

BRUMMEL, George Bryan, 1778–1840 (better known as "Beau" Brummel); a man of wealth and fashion, who became an intimate companion of the prince of Wales, and was looked upon by the society of his day as the "glass of fashion and the mold of form." He was the arbiter in all matters of fashion, and considered the very top of perfection in taste, especially in dress. As long as his fortune lasted or the prince of Wales would contribute, he kept up an elegant bachelor establishment in London; but finally he lost the favor of his royal friend, became poor, gambled recklessly, fled from his creditors, and died in France in a hospital for mendicants.

BRUNCK, Richard François Philippe, one of the most ingenious critics and philologists of modern times, was born at Strasburg, Dec. 30, 1729. He was educated under the Jesuits in Paris; but abandoned his studies, and for some time was engaged as a military commissary during the seven years' war. A professor in Giessen, with whom B. happened to lodge while the army was in winter quarters, revived in him the love of classical studies. Returning to Strasburg, he devoted all his spare time to Greek, and soon distinguished himself as an able but adventurous critic and emendator. His belief that all inaccuracies in ancient Greek writings were introduced by copyists, often led B. astray; but, since the revival of learning, few critics have done more for the progress of Greek literature. His first work, *Analecta Veterum Poëtarum Græcorum* (1772–76), was followed by several editions of Anacreon (1778–86), and

editions of Apollonius Rhodius (1780) and Aristophanes (1781–83), *Poëtæ Gnomici* (1784), Virgil (1785), and Sophocles (1786–89). The last of these established a new era in the criticism of the tragic writers. The outbreak of the French revolution interrupted B.'s studies. He ardently attached himself to the popular side. During the reign of terror, he was imprisoned, but was liberated after the downfall of Robespierre. His means, however, had been so much reduced that he was compelled to sell his valuable library. From this time, 1801, he turned his attention from Greek to Latin literature, and published editions of Plautus and Terence. He died June 12, 1803.

BRUNDUSIUM. See BRINDISI, *ante*.

BRUNE, GUILLAUME MARIE ANNE, a French marshal of the first empire, was b. at Brives-la-Gaillarde, 13th Mar., 1763. His education brought him at an early period into connection with the men of the revolution. Along wih Danton, he helped to establish the Cordeliers' club. After the conquest of Belgium, he was sent as civil commissary to that country, but his warlike aspirations soon induced him to enter the military service. In 1797, he became brigadier under Napoleon in the army of Italy, and distinguished himself at Arcola and Rivoli, where he was made gen. of division and leader of the advance-guard. Sent by the directory to Switzerland in 1798, he executed his orders with brilliant success. In 1799, he was appointed to the command of the army of Holland, where he achieved the reputation of being one of the best generals of his age. He vanquished the Anglo-Russians at Bergen on the 19th of Sept., 1799, and on the 19th of Oct., forced the duke of York, commander-in-chief of the combined armies, to capitulate at Alkmaar, under humiliating circumstances. In 1803, he was named ambassador to the Ottoman porte, and was received by Selim III. with great distinction. In 1804, he obtained the dignity of marshal, and in 1805 returned to France. Two years afterwards, B. became governor-general of the Hanseatic towns, and was charged with the conquest of Pomerania; but circumstances having occurred which unnecessarily excited the distrust of Napoleon, he was recalled, and his future services dispensed with. After the fall of the emperor, he declared for the Bourbons, but his offers were rejected, and in consequence he joined Napoleon after his return from Elba. He was now made a peer, but the battle of Waterloo completely destroyed his prospects. He again made his submission, but was barbarously assassinated at Avignon, 2d Aug., 1815, by the populace, who were infuriated against him on account of certain crimes laid to his charge, of which, however, he seems to have been entirely guiltless.

BRUNEHAUT, or BRUNEHILDE, 534–613; daughter of Athanagild, king of the Visigoths and wife of Sigebert, king of Austrasia. Her sister Galsunda, the wife of Chilperic, king of Neustria and the brother of Sigebert, had been abandoned and murdered by Chilperic at the demand of his mistress, Fredegonda, who became queen. Brunehaut induced her husband (Sigebert) to invade Neustria, where, while besieging Tournay, he was slain by emissaries of Fredegonda, and Brunehaut was taken prisoner by Chilperic. At Rouen she persuaded one of Chilperic's sons to marry her, and, with the help of the bishop of the place, she escaped to Austrasia, which was then ruled by Childebert; but she recovered her authority. After the death of Childebert she provoked war between her grandsons, heirs to the throne, in which one was killed, and she was about to take the throne when a son of Fredegonda, Clothaire II., interposed and captured her easily, as her army refused to fight. She was for three days exposed to torture and insult, and then tied to the tail of a wild horse and dragged to death, after which the body was burned and the ashes scattered to the air.

BRUNE ISLAND lies off the s. part of the e. coast of Tasmania, from which it is separated by D'Entrecasteaux bay. It has a length of 32 m., with a breadth varying from 1 to 6 m.; and its e. or outside coast is indented by a bay, which takes its name from the *Adventure*, one of Cook's two vessels during his second voyage.

BRUNEL, ISAMBARD KINGDOM, an eminent engineer, son of Sir Mark Isambard, b. at Portsmouth, England, in 1806, was educated at the college of Henri Quatre, Caen, in France. He commenced practical engineering in 1826, under his father at the Thames tunnel, and in the progress of that great work was often exposed to danger from the water breaking in and flooding the excavations, having more than once to save his life by swimming. He assisted in his father's experiments for making carbonic acid gas a motive power, and was designer and civil engineer of the *Great Western*, the first steamship built to cross the Atlantic; and of the *Great Britain*, the first ocean screw-steamer. The *Great Eastern*, the largest vessel ever built in the world, was erected under his sole direction. In 1833, B. was appointed chief-engineer to the Great Western railway, and designed and constructed the whole of the tunnels, bridges, viaducts, and arches on this line, and extension branches. Among other docks at English seaports, in the improvement and construction of which he was engaged, may be mentioned the Bute docks at Cardiff, and the old North dock at Sunderland. In 1842, he was employed by government to construct the Hungerford suspension-bridge across the Thames at Charing Cross, London. In 1850–53, he constructed the works of the Tuscan portion of the Sardinian railway. Made a fellow of the royal society in 1830, he was chosen on the council in 1844. He was also vice-president of the institution of civil engineers, and of the society of arts; a fellow of the astronomical, geological, and geographical societies, and chevalier of the legion of honor. He died suddenly, Sept., 1859.

BRUNEL, Sir MARK ISAMBARD, the celebrated engineer of the Thames tunnel, son of an agriculturist, was born at Hacqueville, near Rouen, in France, April 25, 1769. He early showed an inclination for mechanics, and at school preferred the study of the exact sciences to the classics. In 1786, he became a sailor in the French navy. In the revolutionary period of 1793, having compromised himself by his political opinions, he escaped from Paris to the United States. His career as an engineer began in 1794, when he was appointed to survey for the canal which now connects lake Champlain with the river Hudson at Albany. He afterwards acted as an architect in New York. On his return to Europe in 1799, he married the daughter of William Kingdom, esq., Plymouth, and settled in England. A plan submitted by him to government for making block-pulleys for ships by machinery was adopted, and he was for many years employed in carrying it into execution in Portsmouth dockyard. He was also successful in the construction of other public works—in Woolwich arsenal and Chatham dockyard, etc. His most remarkable undertaking was the Thames tunnel, formed beneath the bed of the river, and which, commenced in Mar., 1825, was opened to the public in Mar., 1843. Assisted by his son, the subject of the previous article, he for ten years pursued a course of experiments for employing carbonic acid gas as a motive-power, but the cost of the machinery prevented its introduction as a substitute for steam. Among the less important of B.'s inventions, were machines for making wooden boxes; for ruling paper; for shuffling a pack of cards without using the hands; for the manufacture of nails; and for making seamless shoes for the army—the latter, tried for two years, was abandoned from economical motives. Elected a fellow of the royal society in 1814, he was appointed vice-president in 1832. He was knighted in 1841; and died, Dec., 1849, in his 81st year.

BRUNELLESCHI, FILIPPO, one of the greatest Italian architects, was b. at Florence, in 1377. He first learned the art of a goldsmith; next, that of a sculptor; and finally, devoted himself to architecture. He also studied zealously both mechanical and mathematical science, and is reckoned the first who established, on a sound basis, the theory of perspective. When still a young man, B. went to Rome, where he acquired a profound knowledge of ancient architecture, the result of which was that two ideas completely possessed his mind: the one was to revive the ancient style of architecture; the other was, to make himself master of the mechanical knowledge of the ancient architects. In 1407, he returned to Florence. In 1420, it was proposed to complete the structure of the cathedral of Santa Maria del Fiore, founded in 1296, and now only wanting a dome. A great assembly of architects from all quarters was convened to determine how it might be practicable to cover the vast octangular area. While the debate was going on, B. was earnestly elaborating his own designs; but when he first came forward and proposed his plan, it was so ill received, on account of its supposed absurdity, that B. was "lifted off his legs, and carried out of the room." He, however, obstinately persisted in explaining his scheme, and at last succeeded in convincing every one of its feasibility. The work was intrusted to him, and finished, with the exception of the lantern, with which he intended to crown the whole, but was prevented by his death in 1444. B.'s dome, measured diametrically, is the largest in the world, and served as a model to Michael Angelo for that of St. Peter's. Besides this *chef-d'œuvre*, B. executed several other great works, such as the churches of San Spirito and San Lorenzo, as well as the designs for the Pitti palace, which originated the beautiful style of Tuscan palace-architecture in the 15th century.

BRUNI, LEONARDO, a native of Arezzo, and hence styled *Aretino*, was b. in 1369. He merits notice as one of the most learned men who flourished during the epoch of the revival of Greek learning in Italy. He first studied law at Florence and Ravenna, but afterwards turned his attention to classical literature. He then went to Rome, where he filled several offices at the papal court. In 1414, he attended John XXII. to the council of Constance. On the deposition of that pope, he returned to Florence, where he was of service to the republic in several important matters. His *Historia Fiorentina* procured for him the rights of citizenship, and, at a later period, through the favor of of the Medicean family, he was appointed state-secretary. He died 9th Mar., 1444. Florence and Arezzo vied with each other in the splendor with which they celebrated his obsequies.

B. aided in advancing the study of Greek literature mainly by his literal translations into Latin of Aristotle, Demosthenes, Plutarch, and others. Of his original works, which are very numerous, many have never been printed, and most are nearly forgotten. We may mention *Commentarius Rerum suo Tempore Gestarum* (Ven. 1476); *De Origine Urbis Mantuæ; De Romæ Origine; Epistolæ Familiares;* and *Vite di Dante e del Petrarca.*

BRÜNN, a fortified city of the Austrian empire, capital of the government of Moravia, is beautifully situated, partly on the slope of a hill, and partly in a pleasant valley, at the confluence of the Schwarzawa and the Zwittawa, in lat. 49° 12′ n., and long. 16° 37′ east. Behind the city, on an eminence, is situated the castle of Spielberg, formerly the citadel, but now used as a state-prison, and noteworthy as the place in which Silvio Pellico was confined from 1822–30. Among the most interesting buildings of B. are the cathedral of St. Peter; St. James's church, a Gothic edifice, with a tower 276 ft. in height, and a valuable collection of ancient printed books; the church of the Minorites; and the Augustine convent. There are also several fine palatial residences belonging to the old

nobility. B. is one of the most important manufacturing towns in the Austrian dominions. Its woolens are specially celebrated, and it has also manufactures of cotton, silk, ribbons, yarns, glass, leather, soap, tobacco, and dye-stuffs. Pop. Dec. 31, '81, 82,660. Napoleon made B. his headquarters before the battle of Austerlitz.

BRUN'NEN, a village of Switzerland, in the canton of Schwyz, of which it forms the port, near the mouth of the Muotta, in the lake of Lucerne. It is beautifully situated at the south-eastern bend of the lake, and is celebrated in history as the place where, in Dec., 1315, the deputies of the forest cantons, who, eight years before, had formed a plan for the liberation of their country from the Austrian yoke, laid the basis of the Helvetic republic

BRUNNER, SEBASTIAN, b. 1814; chaplain of the university of Vienna, where he studied theology. In 1848, he established the *Vienna Church Gazette.* Soon after he published, under the name *Nebeljungen-Lied*, a satire upon Hegel's doctrines. His entire works have been collected in 20 vols. Among them is a sharp criticism of Renan's *Life of Christ.* In all his writings he is of the ultramontane Roman Catholic school.

BRUNNER, or BRUNN, JOHANN CONRAD, 1653–1727; a German anatomist, professor in the university of Heidelberg, and physician to the elector palatine. He made many anatomical investigations, particularly in the pancreas, the small intestines, and the duodenum. His name lives in the *Brunner's Glands.*

BRUNNOW, Count, ERNEST PHIL. VON, a Russian diplomatist, was b. at Dresden, 1797, and studied at the university of Leipsic. At the time of the congress of Aix-la-Chapelle, he entered the Russian service, and the ministers Nesselrode and Capo d'Istrias recognized at once his fitness for a diplomatic career. Among other posts, he attended the congresses of Troppau and Laybach, acted one year as secretary to the embassy in London, went to the congress of Verona, and then occupied for a time a high office in St. Petersburg. He was present, in a civil capacity, in the campaigns of 1828 and 1829 against the Turks. In the autumn of 1839, he was sent on a special mission to London, to take advantage of the unpleasant feeling between Great Britain and France for drawing the cabinets of St Petersburg and London closer together, and in the following spring was accredited as permanent ambassador. In this capacity he soon acquired distinction as a diplomatist. After retiring from London on the outbreak of the war in 1854, he represented Russia in Frankfort, and, along with count Orloff, was sent to the conference of Paris, Feb., 1856. Immediately after the treaty of peace had been concluded, he was sent on a special mission to London, to re-establish friendly relations between the courts of St. Petersburg and St. James's. He was afterwards appointed to the court of Prussia; but in 1858 he returned to his old place in London, where he was a great favorite. He represented Russia at the conferences in London in 1864 and 1871. In recognition of his services, he was raised by the emperor of Russia to the rank of count in April, 1871. In 1874, he retired to Darmstadt, where he died in the following year.

BRUNO, SAINT, the founder of the Carthusian order of monks, was b. at Cologne 1051, and received his earliest education in the school attached to the collegiate church of St. Cunibert. Subsequently, he studied at Rheims, where he distinguished himself so greatly, that bishop Gervasius appointed him director of all the schools in his diocese. B., however, soon began to be troubled by the wickedness of his time, and, anxious to escape from what seemed to him the general pollution, he took refuge, along with six pious friends, in a desert place near Chartreuse, in the diocese of Grenoble. Here, in 1086, he founded one of the most austere of all the monkish orders, which received its name from the locality whence it had sprung. See CARTHUSIANS. B. and his companions had each a separate cell, in which they practiced the severities of the rule of St. Benedict, keeping silence during six days of the week, and only seeing one another on Sundays. Pope Urban II., who was one of B.'s most eminent scholars, in 1089 summoned the saint to Rome. B. obeyed the call reluctantly, and steadily refused all offers of preferment. In 1094, he established a second Carthusian monastery, called La Torre, in a solitary district of Calabria, where he died in 1101. He was not canonized until 1628. B. left no written regulations for his followers. These first made their appearance in a complete form in 1581, and were enjoined on all Carthusians by Innocent IX.

BRUNO, THE GREAT, Archbishop of Cologne, and Duke of Lorraine, one of the most eminent men of his time, was b. about 928 A.D. He was the third son of Henry the fowler, and the brother of Otto I., emperor of Germany. Baldrich, bishop of Utrecht, and afterwards Israel Scotigena, and others, were his tutors. His surprising knowledge, sagacity, and eloquence secured for him an immense influence over the bishops and clergy, while, on the other hand, his liberality, meekness, and great earnestness of heart won the affections and reverence of the laity. Summoned by Otto to the imperial palace, he quickly assumed an influential position among the chroniclers, poets, and philosophers of the court. At a later period he was appointed archbishop of Cologne, and lord high chancellor of the empire. He accompanied Otto to Italy in 951, and honorably distinguished himself by his fidelity to his brother, when Otto's own son, Conrad, and others of his kindred rebelled against him. As a reward, the emperor appointed

him duke of Lorraine. B. died at Rheims, 11th Oct., 965. He wrote a commentary on the Pentateuch, and several lives of saints.

BRUNO, GIORDANO, the precursor of the school of modern pantheistic philosophers, was born at Nola, in the kingdom of Naples, about the middle of the 16th century. He entered, at an early age, the order of the Dominicans, but soon began to express his doubts in regard to the doctrines of transubstantiation and of the immaculate conception, in consequence of which he was obliged to flee from his convent. Henceforth, his life was unsettled. In 1580, he went to Geneva, where he spent two years, but having excited the suspicion and dislike of the strict Calvinists of that city by his general skepticism, he judged it prudent to betake himself to Paris, where he delivered prelections on the "great art" (logic) of Raymond Lully. His disputes with the bigoted Aristotelians of the university of Paris compelled him, however, to leave France. He passed over into England, where he resided for two years in comparative quiet, enjoying the friendship of sir Philip Sidney and the protection of the French ambassador, Michel de Châteauneuf de la Mauvissière. Here he composed his most important works, but at last, having incurred the displeasure of the clergy by his vehement denunciation of the Aristotelian philosophy, and other grave heresies, he returned to Paris in 1585. In 1586, he proceeded to the university of Marburg, where he matriculated; and to Wittenberg, where he became professor; but being asked to join the Lutheran communion, he refused. On his departure from the city, he pronounced an impassioned panegyric on Luther. After spending some time in Prague, Brunswick, Helmstadt, and Frankfort-on-the-Main, he resolved to go back to Italy. He fixed his residence at Padua; but after a stay of two years, he went to Venice, where he was arrested by the officers of the inquisition, and conveyed to Rome in 1598. He was now subjected for two years to persecution, in the vain hope that he would recant; but when all the endeavors of his enemies proved ineffectual, he was brought to the stake on the 17th Feb., 1600, and burned as an obstinate heretic.

B.'s writings, of which the most valuable are composed in Italian, display throughout a strong, courageous, excitable soul, susceptible of deep enthusiasm, but vainly laboring to attain perspicacity. The *Cena delle Ceneri*, or evening conversations on Ash-Wednesday, is an apology for the Copernican astronomy; the *Spaccio della Bestia Trionfante*, or expulsion of the triumphant beast (Par. 1584), is a satirical but somewhat heavy allegory in the style of the times. His greatest works are metaphysical, such as the *Della Causa Principio ed Uno* (On the One Sole Cause of Things) and the *Del Infinito Universo e Mondi* (On the Infinity of the Universe and of Worlds). The doctrine enunciated in these is pantheistic. B. held that the infinite soul of God did not merely inhabit or pervade the universe, but that the universe was simply a manifestation of him, and therefore itself divine. God was therefore, in the most literal and physical sense, all *in* all. B.'s philosophy, in later times, was quite unappreciated, and even neglected, until Jacobi drew public attention to it in his *Letters on the Doctrine of Spinoza*. Both Spinoza and Descartes were much indebted to Bruno. His influence is also discernible in the pantheistic speculation of modern Germany. Original editions of B.'s works are very rare. Those in Italian were published by Wagner in 1830: some Latin ones by Gfrörer in 1836. See Bartholomè's *Bruno* (1846); Berti's *Vita di B.* (1868).

BRUNSWICK, a co. in s.e. North Carolina, on the ocean and cape Fear and Waccamaw rivers; 1100 sq.m.; pop. '80, 9390—4052 colored. It is level and swampy, with poor soil, but producing rice and cotton. Tar, rosin, and fine lumber are exported. The railroads are the Washington, Columbia and Augusta, and the Wilmington and Weldon. Co. seat, Smithville.

BRUNSWICK, a co. in s.e. Virginia, on North Carolina, watered by the Roanoke and Nottaway rivers; 600 sq.m.; pop. '80, 16,707—10,636 colored. Productions, tobacco, corn, wheat, etc. Co. seat, Lawrenceville.

BRUNSWICK, a t. in Glynn co., Ga.; a port of entry on St. Simon's sound, 8 m. from the ocean, and 80 m. s.s.w. of Savannah, at the s.e. terminus of the Macon and Brunswick and Albany railroads. There is a lighthouse at the entrance of the sound, and the harbor is spacious and safe. Pine lumber is the chief article of export. Pop. '80, 2891. Steamers connect B. with New York, Savannah, and Fernandina.

BRUNSWICK, a t. and village in Cumberland co., Me., on the Androscoggin, 8 m. w. of Bath. It is at the head of navigation and the foot of water-power on the river, and has mills and other manufacturing establishments, Here are Bowdoin college and the Maine medical school. The Maine Central and other railroads unite at B. Shipbuilding and lumbering are leading industries. Pop. '80, 5384.

BRUNSWICK, DUCHY OF (Ger. *Braunschweig*), a state of northern Germany, consisting of three larger and five smaller distinct parts, and lying mostly within lat. 51° 38′ to 52° 28′ n., and long. 9° 23′ to 11° 30′ east. Its entire area amounts to about 1425 sq. miles. Pop. in 1875, 327,493. For administrative purposes, B. is divided into six circles—viz., Brunswick, Wolfenbüttel, Helmstedt, Gandersheim, Holzminden, and Blankenburg. Of the three larger parts, the principal one, forming the circle of Wolfenbüttel, and including the capital, lies between Prussia and Hanover; the second, extending e. and w. from Prussia to the Weser, divides Hanover into two parts; and the third, forming the circle

of Blankenburg, lies to the s.e. between Hanover, Anhalt, and Prussia. The smaller parts are the isolated bailiwicks of Calvörde in the e., Thedinghausen in the w. (not far from Bremen), and some very small demesnes in the Hanoverian boundaries. B. belongs mostly to the basin of the Weser, which serves as a boundary on the west. The surface is mostly mountainous, particularly in the southern portions of the country, but B. has nevertheless level tracts of considerable extent. The rivers, with the exception of the Weser, are comparatively unimportant, though advantage is taken of one or two for the transport of timber. The climate in the low lands resembles the general climate of northern Germany; but in the Harz district it is so much colder, that harvest is generally a month later than in the plains.

The mines and quarries of B. produce marble, alabaster, limestone, gypsum, alum, iron, copper, lead, sulphur, and salt in large quantities, with some portions of gold and silver. Agriculture, which is carried on with intelligence and energy, constitutes the chief wealth of the duchy. The products include, beside the ordinary cereals, large quanties of leguminous plants, potatoes, tobacco, and hops. The pasture-land is extensive, and great attention is paid to the rearing of cattle, and especially to the breeding of sheep, wool being an important article of commerce. A large number of persons are employed in the cutting and preparation of timber. The chief manufactures of B. are of linen, stockings, woolen cloth, metals, porcelain, paper, sugar, glass, beer, etc.

The inhabitants are mostly Saxons, and, with the exceptions of about 3000 Reformed, 7000 Roman Catholics, and 1100 Jews, all adhere to the Lutheran church. The people in the rural districts speak a very broad low-German dialect; but good high-German is spoken by the educated classes. Education is well looked after by the government, which is a limited monarchy, the duke being head of the state, and his power restricted by the legislature, which is partly hereditary and partly elective. As a state of the German empire, B. has two votes in the Bundesrath (confederate council), and sends three deputies to the Reichstag or parliament.

Taxes are voted triennially in Brunswick. The revenue for the three years ending 1878 was 7,700,133⅓ marks (£385,006) a year. The public debt in 1876 amounted to 91,874,442 marks (£4,593,722), of which a large portion was borrowed for the construction of railways. The civil list of the duke is not comprised in the budget, being paid out of a special fund consisting of the revenues of the state domains, which amount to 729,166 marks, and other receipts amounting to about 70,000 marks.

B. was included, as a part of Saxony, under the empire of Charlemagne. In 1235, B., with Lüneburg, was made a duchy under Otto, who died in 1252, and was succeeded, in 1267, by his son Albrecht, founder of the older line of Wolfenbüttel. John, another son of Otto, was the founder of the older Lüneburg line, which became extinct with William of Lüneburg in 1369. In 1569, Henry, who styled himself duke of Brunswick-Lüneburg-Dannenberg, founded the new house of Brunswick-Wolfenbüttel; and his brother William founded the new line of Brunswick-Lüneburg, which, in 1815, became the kingdom of Hanover. See HANOVER.

BRUNSWICK, the capital of the duchy of Brunswick, is situated on the Oker, in a level and fertile district, in lat. 52° 46′ n., and long. 10° 4′ east. B., which is a very old place, is supposed to have been first walled about the 9th c., by Bruno, duke of Ostfalen. But Henry the lion, in the 12th c., so greatly beautified and extended the city that he may be almost said to be its founder. In the 13th c., B. became a member of the Hanse league, and soon attained considerable commercial prosperity, but its importance declined with the decay of the league. The town is most irregularly built, with narrow and crooked streets, but possesses the advantages of good causeways and an abundant supply of water. The cathedral—in which are preserved some interesting relics brought by Henry the lion from the Holy Land—with the churches of St. Martin, St. Catharine, and St. Andrew, with its steeple 316 ft. high, are among the principal buildings. In the museum are some interesting antiquities and works of art by Jan Steens, Albert Dürer, Holbein, Rembrandt, Raphael, Guido, Ruysdael, Michael Angelo, and Benvenuto Cellini. The industry of B. consists chiefly in manufactures of woolen and linen, chicory, beet-sugar, tobacco, *papier-mâché*, lackered wares, etc. Its great annual fair, founded in 1498, is important. The old fortifications of B. have been demolished, and their site converted into pleasant promenades. A fine avenue of linden-trees leads to the duke's palace, an imposing edifice, built in 1869. Pop. '75, 65,938.

BRUNSWICK, HOUSE OF. Henry the Lion, who held the united duchies of Bavaria and Saxony in the 12th c., may properly be called the immediate ancestor of this house, though they can trace their lineage back to Albert Azo I., margrave of Este in Italy, who died in 964. The eldest son of Henry the Lion became count palatinate by marriage; his second son, Otho, died in 1218 after having been crowned German emperor, and it was therefore William, a younger son, who succeeded to the Brunswick inheritance. Otho, a grandson of Henry the Lion, was invested in 1235 with these domains as a fief of the empire and recognized as the first duke of Brunswick. Ernest the Pious, or the Confessor, who died in 1546, inherited the principalities of Brunswick-Luneburg, and was the founder of both branches of the existing dynasty; he took an active part in the reformation and signed the confession of Augsburg. His descendant, Ernest Augustus, duke of Brunswick-Luneburg, was raised to the dignity of ninth elector of the empire in

1692, by his marriage with Sophia, a grand-daughter of James I. of England. His son George Lewis succeeded to the crown of Great Britain in 1714. Ferdinand, a later duke of this house, entered the Prussian service in 1740, distinguished himself in the seven years' war, decided the battle of Prague, and gained the victories of Corfeld and Mindon. The ducal residence, which had been at Wolfenbuttel, was in 1754 removed to Brunswick by duke Charles; he founded the famous Collegium Carolinum, and was a faithful ally of England during the seven years' war. He died 1780. His successor, Charles William Ferdinand, was a nephew of Frederick the great, and married Augusta, daughter of George III. of England. He fought in the seven years' war, and played an important part at the battle of Krefeld in 1758. In 1792 he was commander-in-chief of the allied armies of Austria and Prussia against France. He marched into Champagne, but was compelled to conclude an armistice with Dumouriez after trying in vain to force the position of Valmy. In 1806 he was called to lead the Prussian troops against Napoleon, who defeated him at Jena and Auerstadt; he retired broken-hearted, and died soon afterwards from the effects of his wounds. Napoleon incorporated his duchy with the new kingdom of Westphalia, but after the battle of Leipsic it was restored to his son Frederick William, who had distinguished himself in the campaigns of 1792, 1793, 1806, and who fell at the head of his troops at the battle of Quatre-Bras in 1815. His son Charles Frederick was a minor, and up to 1823 George IV. of England acted as prince-regent. The people of B. endured the misrule of Charles Frederick for seven years; then they revolted and drove him out of his duchy in 1830. He died childless at Geneva in 1873. By an act of the Germanic diet the duchy was transferred to his brother William, prince of Oels (b. 1806), who assumed the government, April 25, 1831. He is still unmarried, and, if he dies without issue, Brunswick will pass to the house of Hanover.

BRUNSWICK BAY, on the n.w. coast of Australia, in long. 125° e., and about lat. 15° south. It receives Prince Regent river.

BRUNSWICK BLACK is a varnish employed for coating over coarsely finished iron grates, fenders, etc. It is mainly compounded of lamp-black and turpentine, and when applied with a brush, quickly dries, and leaves a shining jet-black surface.

BRUNSWICK GREEN is a pigment used in the arts, and consisting of the hydrated chloride and oxide of copper (CuCl,3CuO,4HO). It may be prepared (1) by acting upon metallic copper with common salt and diluted sulphuric acid, (2) by acting upon metallic copper with moistened sal-ammoniac, or (3) by mixing sulphate of copper and common salt into a paste with water. It is found native at Atacama, in Peru, in the form of a green sand, hence the name atacamite (q.v.).

BRUNSWICK, New. See New Brunswick.

BRUSA, or Bursa. See Broussa, *ante.*

BRUSASOR'CI, or Domenico Riccio, 1494–1567; an Italian painter noted for his close imitation of Titian. He worked chiefly in fresco, and on mythological themes. The "Coronation of Charles V.," the "Procession," "Phæthon," and the "Martyrdom of St. Barbara," are among his more important achievements.

BRUSH, George Jarvis, b. New York, 1831; educated at Yale, and at Munich, and the Freiberg mining academy; chief of the Sheffield scientific school (of Yale), and professor of mineralogy and metallurgy in Yale college. He has written upon various scientific subjects in the *American Journal of Science*, and assisted in editing Dana's *Mineralogy*.

BRUSHES and BROOMS, implements of vegetable fiber or hair of very early use, mentioned by Homer. Brushes are simple or compound. The simple kind consists of but one tuft, and are such as hair pencils and painters' brushes. The compound have more than a single tuft. Where they are placed side by side on flat boards they are called stock brushes. Those with single tufts, such as are used by artists, are made of the hair of the camel, goat, badger, and of hog's bristles. The hairs for pencils are arranged so as to form a point in the center, and are fixed in a quill or other small tube. Compound brushes are of set or pan work, and of drawn work. The ordinary house broom is an example of pan work, into the stock of which holes are bored of the size desired. The bristles, hairs, or fibers needed to fill each hole are collected; the thick ends dipped into molten cement, usually pitch, bound with thread, dipped again, and with a quick twist set into the hole. In drawn brushes, those intended for shoes, teeth, nails, etc., and clothes, the holes are more carefully bored, and have smaller ones at the top communicating with the back of the brush, through which a loop of wire passes from the back of the stock. Half the number of hairs or fibers needed to fill the holes are passed around the wire, which is then smartly drawn up so as to double the hairs and force them as far as possible into the hole. The outside ends are made even with trimming, and the backs of the brushes are covered with veneer to conceal the wire-work. Bristles are imported from Poland, Russia, and other countries. In 1808, the manufacture of brushes from the fibers of whalebone, and in 1810, from twigs of broom, rushes, and other plants, was patented. In 1842, split quills were added, and in 1872, horn and other substances. The great staple in the United States is broom-corn, a considerable amount being raised in the state of New York, and manufactured by the Shakers. Revolving

brushes were patented in 1811; and in 1862, revolving hair brushes, for the use of barbers, were introduced, but they have never become popular. As long ago as 1699, there was invented "a new engine for sweeping the streets of London, or of any city or town." But nothing of the kind was put in use until 1825, when revolving brooms were used. A great many improvements followed, and at the present time street-sweeping by such machines is common in large cities. The most important recent invention in brush-making is of American origin, the Woodbury machine for bunching, wiring, and inserting bristles in the stock. In this machine a metal comb of uniform thickness is filled with bristles, holding them by the middle, so that one half of the bristles appear above the surface of the comb, and the other half underneath. The comb thus charged moves in guide-ways, and discharges bristles from each division successively into a channel in which they are brought into a horizontal position and a proper quantity taken up to form a tuft. This tuft is moved along an incline against the end of a cylinder, when a plunger doubles the bristles into a loop, which is seized by wire, and in an instant securely fastened.

BRUSH TURKEY, the native name of an Australian bird of the megapodiidæ family, of which a dozen species are known; called also the New Holland vulture, jungle fowl, and native pheasant. It is the only wild fowl known that is gregarious in the duty of hatching. Before the time for laying eggs, several pairs of these birds unite in building an enormous pyramidal heap of vegetable matter in part decayed. In this muck-heap of leaves, grass, and rotting wood the females deposit their eggs, which are placed about a foot from each other and covered 2 ft. deep. The hatching is done by the heat of the decaying matter, and the young appear full feathered and able to take care of themselves from the first. Nests have been found that contained a bushel of eggs. Some species of the brush turkey place their eggs in sand, some construct huge mounds of earth, and some make excavations on the sea-shore. In size and general appearance it much resembles the common domestic turkey.

BRUSSELS (Fr. *Bruxelles*), the capital of Belgium, is situated on the small river Senne, a tributary of the Dyle, in lat. 50° 51′ n., and long. 4° 21′ east. It communicates with Antwerp and the Baltic sea, by means of the Scheldt canal, and railways connect it with Germany, France, and Holland, as well as with all the principal towns of Belgium. The city is built partly on the side of a hill, and partly on a fertile plain; and though some of the streets are so steep that they can be ascended only by means of stairs, B., on the whole, may be pronounced one of the finest cities in Europe. The upper town, situated on the side of the hill, is the newest and most fashionable, and is the residence chiefly of the great and wealthy. The king's palace, public offices, chief hotels, and mansions of foreign ministers are here. It is also much more healthy than the lower town, which, stretching along the canal and the Senne, is greatly subject to fogs. But the latter, with its numerous handsome old buildings, formerly belonging to the Brabant nobility, but now occupied by merchants and traders, has a fine picturesque appearance, while some of its public edifices are unrivaled as specimens of Gothic architecture. This part has also several noble churches, but it is now wholly given over to trade. French is spoken in the upper part of B.; but in the lower, Flemish is prevalent, and in one quarter the Walloon dialect is spoken. The English language, owing to the large number of English who reside in B. for economy, is also very common. The walls which formerly surrounded B. have been removed, and their place is now occupied by pleasant boulevards, shaded by alleys of trees, extending several miles. The *Allée Verte* —a double avenue along the Scheldt canal—forms a splendid promenade, and leads towards the palace of *Laeken*, the suburban residence of the royal family, 3 m. n. of the city. Besides the fine park in the upper town, covering an area of some 17 acres, ornamented with fountains and statues, and surrounded by the king's palace, the "palace of the prince of Orange," the chamber of representatives, and other buildings, B. has several other squares or places, among which the most noteworthy are—the *Place Royal*, with its colossal monument of Godfrey of Bouillon; the *Grand Place*, in which is situated the Hôtel de Ville, a splendid Gothic structure, erected in the beginning of the 15th c., with a pyramidal tower 364 ft. high, surmounted by a statue of St. Michael, the patron saint of B., and where, in 1568, the patriot counts, Egmont and Horn, were beheaded by order of the duke of Alba; and the *Place des Martyrs*, where a memorial has been erected to those who fell here in the revolution of 1830. Among the churches of B., the largest and finest is the cathedral of St. Gudule, which dates from the 12th c., and is built in the pointed Gothic style, with two towers of more modern date, rising on each side to a height of 264 ft., many richly painted windows, a pulpit, considered the masterpiece of Verbruggen, and monuments of the dukes of Brabant and other distinguished persons. In the *Palais des Beaux Arts* is the picture-gallery, containing the finest specimens of the Flemish school of painting; the public library, with its 234,000 volumes, and its 20,000 MSS., collected by the dukes of Burgundy—MSS. interesting and valuable not only for their contents, but for the beautiful miniature paintings with which the scholars of Van Eyck adorned them. The observatory is one of the finest in Europe. The educational establishments of B. are numerous, the principal being the free university, founded in 1834, with four faculties—viz., law, medicine, mathematical and physical sciences, and belles-lettres, and having a special school of

pharmacy attached. It has also numerous charitable and benevolent institutions; and is the seat of the provincial government of s. Brabant, as well as of the general government of the kingdom. B. is one of the chief centers of the industry of the country. Its lace is particularly famous. Of the esteemed carpets which pass under the name of B. carpets, only a few are manufactured here, most of those of Belgic make being produced at Tournai. It has also manufactures of damask, linen, ribbons, paper, jewelry, hats, soap, porcelain, mathematical and musical instruments, etc. Carriage-building is also an important branch of industry. Printing and lithographic establishments are numerous; and about a dozen newspapers, of which the *Indépendance Belge* has a European reputation, are published daily. Pop. in 1881, 165,350; with suburbs, 388,780.

As early as the 8th c., we find B. (*Bruchsella*), then probably a villa of the Frank kings, mentioned in old chronicles, and that a church existed here in 966 is proved by a deed of the emperor Otho I. Under Charles V., B. was made the court-residence in the Netherlands, and became afterwards, under Philip II., the chief arena of the revolution, and of the atrocities committed by the duke of Alba and the inquisition. B. suffered greatly in the war of Spain against Louis XIV.—in whose reign it was bombarded by marshal Villeroi, and upwards of 4000 buildings destroyed—and in that of Austria against Louis XV.; but still more from the continual prevalence of party animosities caused by the policy of Austria. Under the mild rule of Maria Theresa, B. flourished greatly, and in this time, many of its best institutions and public buildings were founded. In 1789 occurred the Brabant revolution under Joseph II., and scarcely had Austrian rule been re-established, after a brief time of independence, when B. fell into the hands of the French, 1792. After other changes of fortune, B., with the other parts of Belgium, was incorporated with the kingdom of the Netherlands in 1815, and so remained until the revolution of 1830, by which it became the capital of the independent kingdom of Belgium.

BRUSSELS CARPETS. See CARPETS.

BRUSSELS SPROUTS, one of the many cultivated varieties of *brassica oleracea* (see BRASSICA and CABBAGE), distinguished by producing, in the axils of the leaves, little clusters of leaves which close together and form miniature cabbages. These are used, like other greens of this species, for the table, and are very delicate. The plant is cultivated much in the same way as cabbage or kale, requiring, however, less space than most of the varieties. It may be planted in shady situations, or between the rows of crops, such as pease, beans, scarlet-runners, etc., which are to be removed from the ground in autumn. The sprouts are fit for use chiefly in winter and spring. The stem sometimes attains a height of 4 ft., and the head resembles a small, imperfectly boiled savoy; but there is a subvariety with shorter stems, preferable for many situations. In some places, it is customary to remove the head early in winter, in order to promote the development of the lateral shoots in spring; but if the head is allowed to remain, the plant becomes taller, and new shoots are formed as the lower ones are removed. The seed is sown in Feb. or March. Seed is very generally imported from Belgium, as this vegetable is said to degenerate in Britain. Its use has of late rapidly extended, and none of the many varieties of the species to which it belongs is better deserving of cultivation.

BRUTTIUM, an ancient division of Italy, comprising the s. portion, now Calabria. The people known as Bruttians became rulers in the peninsula about 356 B.C. Before that period the people seem to have been of some Pelasgian races, but at an early date Greek adventurers started settlements on the coast, of which the more important were Crotona, Rhegium, and Locri. The warlike Greeks subjected the natives and held them in slavery until after the Peloponnesian war. At that period the Lucunians came in from the N. and still further oppressed the natives. At last, about the middle of the 4th c. B.C., the people rising against oppression became their own masters; they gained power rapidly, captured some of the Greek cities, and, assisted by the Lucanians, held their own against the Grecian arms. The B. were powerful until after their participation in the Samnite war against Rome, 282 B.C. Not long afterwards they were subjected to Rome and gave up much of their territory. In the second Punic war they revolted and assisted Hannibal, for which they were punished by Rome in the sacrifice of what little they had left of independence. At that time the Brutti as a nation disappeared from history.

BRUTUS, LUCIUS JUNIUS, figures in the legendary history of early Rome, as the hero who overturned the monarchical, and established the republican form of government. The legend runs that he was the son of a rich Roman. On his father's death, Tarquin the proud took possession of the property, and put an elder brother to death, and B. himself only escaped the same fate by feigning idiocy (hence the name *Brutus*, stupid). The oracle of Delphi foretold that he should govern in Rome. Remembering his own wrongs, and gifted with the strength and wisdom of one who was fulfilling the decrees of fate, B., when the foul rape committed by one of the royal family upon Lucretia had shocked the people, convoked them, placed himself at their head, and drove the kings from Rome. He is said to have been then elected one of the two first consuls (509 B.C.). That his character as a stern old Roman hero might be complete, the legend adds that he sacrificed to the new republic his own sons, detected in a conspiracy to restore the

monarchy; and that at last he fell in mortal combat repelling an attack led on by one of the sons of Tarquin. Little more, however, can be said to be established upon sufficient historical evidence with regard to B., than that there existed a person of that name who held high office in Rome at a very early period.

BRUTUS, MARCUS JUNIUS, b. 85 B.C., appears to have spent the early years of manhood in exclusive devotion to literary pursuits, and not to have taken part in the political dissensions agitating Rome till he had attained a mature age. When the civil war broke out between Pompey and Cæsar, he sided with the former; but after the battle of Pharsalia, made his submission to the latter, and, in the following year, was appointed governor of Cisalpine Gaul. On returning to Rome, he divorced his wife, in order to marry Portia, the daughter of Cato, of whose principles in politics he professed to be a disciple. The influence of Cassius prevailed upon him to join the conspiracy which ended in the murder of Cæsar. The efforts of B. to retain popular favor afterwards being unavailing to counteract the effects of the eloquence of Antony, he was forced to leave first Rome, and then Italy. The remainder of his life was spent partly in Athens, partly in Asia Minor, and partly as the leader of a marauding force which maintained itself by plundering the inhabitants of the eastern shores of the Adriatic. Defeated by Antony and Octavianus (Augustus) at Philippi (42 B.C.), he terminated his life by falling upon his sword.

BRÜX, a t. of Bohemia, situated on the Bila, about 14 m. n. of Saatz. In its vicinity are extensive coal-mines, and the famous mineral springs of Püllna and Seidlitz, from which the inhabitants of B. prepare a considerable quantity of salts. Pop. Dec. 31, '81, 9995.

BRUYAS, JACQUES, 1637–1712; one of the Jesuit missionaries in Canada, employed among the Iroquois. He mastered their speech, and wrote some pious works in it. In 1862, his *Radical Words of the Mohawk Language* was first published.

BRUYÈRE, JEAN LA. See LABRUYÈRE.

BRUYS, or BRUIS, PETER DE, a priest of southern France supposed to have been one of Abelard's pupils, founder of a sect by the name of Petrobrussians. He opposed the church as it was, seeking to restore the Christian religion to its original simplicity and freedom from symbols, denied the authority of any established hierarchy and the necessity of any priestly ministration, opposed infant baptism and the communion, and held that, as prayer could be offered anywhere, churches were useless. His followers destroyed images, burnt crosses, and maltreated priests. After many years of non-molestation B. was burnt at the stake at St. Gilles. The sect existed for a long time under the name of Henricians, from Henry of Lausanne, one of their leaders.

BRYAN, a co. of e. Georgia, on the sea-coast; 472 sq. m.; pop. '80, 4929—2561 colored. The soil is level and mostly of sand, and in a large degree covered with pine forests. The Atlantic and Gulf railroad passes through the county. Productions, rice, corn, cotton, etc. Co. seat, Eden.

BRYAN, MICHAEL, 1757–1821; an English art critic and connoisseur, author of a *Dictionary of Painters and Engravers*, a recognized standard work. In 1794, he was employed by several English noblemen to purchase the celebrated Orleans gallery of paintings, an achievement which widely enhanced his reputation.

BRYANT, JACOB, an eminent English scholar, was b. at Plymouth in 1715. He was educated at Eton and King's college, Cambridge, where he took his degree of M.A. in 1744. In 1756 he became private secretary to the duke of Marlborough, and accompained his grace to the continent. Substantial proofs of the duke's esteem raised him above the region of pecuniary cares, and enabled him to devote his whole life to letters. He d. 14th Nov., 1804. Among his numerous publications may be mentioned: *Observations and Inquiries relating to various Parts of Ancient History* (Cambridge, 1767); *A New System or Analysis of Ancient Mythology* (1774–76); *Vindiciæ Flavianæ* (a defense of Josephus' testimony in regard to Christ), (1780); *Treatise on the Authenticity of the Scriptures and the Truth of the Christian Religion* (1792); *A Dissertation concerning the War of Troy, etc.* (1796); *The Sentiments of Philo-Judæus concerning the Logos* (1797); and a variety of dissertations on the difficult passages of Scripture (1803). B. was a man of great and varied learning, but his intellect, although acute, was neither philosophical nor comprehensive enough to enable him to handle in a satisfactory manner the important questions on which he wrote.

BRYANT, WILLIAM CULLEN, a distinguished American poet and journalist, was b. in Hampshire, Mass., Nov. 3, 1794. At the early age of 10, he published translations from some of the Latin poets; at 13, he wrote a terse and vigorous political poem, entitled *The Embargo;* and at 18, he composed his *Thanatopsis*, a poem full of beauty. In 1815 he was admitted to the bar, and for ten years practiced with diligence and success. In 1825 he removed to a more congenial sphere, and in association with a friend, established *The New York Review*, to which he contributed many of his best poems. In 1826 he became principal editor of *The Evening Post*, the leading democratic paper of New York, which he conducted with a manliness and purity of tone that might be imitated by his professional brethren with great advantage to the character of the press.

The first collected edition of his poems appeared in 1832. They were soon after republished in Britain, and were regarded as the highest efforts, up to that time, of the American muse. In 1842, he published *The Fountain and other Poems.* B. visited Europe in 1834, and several times afterwards, and records his observations in *Letters of a Traveler in Europe and America.* In 1858, appeared a new edition of his poetical works, and in 1869, a metrical translation of the *Iliad,* followed in 1871 by that of the *Odyssey.* He afterwards engaged in writing a *History of the United States.* Although the popularity of B.'s wirtings has been eclipsed by those of Longfellow and Poe, they have yet a large circle of readers and admirers. B. died 12th June, 1878.

BRYAXIS, a Greek sculptor, contemporary of Praxiteles and Scopas, with whom he participated in the work on the mausoleum at Halicarnassus about 345 B.C. He also created five colossal figures of the gods at Rhodes, of Bacchus at Cnidus, of Æsculapius and Hygeia at Megara, Apollo in the grove of Daphne at Antioch, a statue of Pasiphæ, and a portrait of Seleucus. It is thought that B. was the first to produce statues of Æsculapius and Serapis.

BRYCE, JAMES. See page 881.

BRYDGES, Sir SAMUEL EGERTON, 1762–1837; an English author, bred to the law. He was a prolific writer, and is said to have produced 2000 sonnets in a single year. His more important works are *Censura Literaria* in 10 vols. and his own *Autobiography, Times, and Opinions.*

BRYENNIOS, PHILOTHEOS. See page 881.

BRY'ONY, *Bryonia,* a genus of plants of the natural order *cucurbitaceæ,* distinguished by triadelphous stamens, with distinct anthers, a trifid style, and a few-seeded fruit destitute of hard rind. The stems climb by means of lateral tendrils, the leaves are angular or 3 to 5-lobed, and the flowers campanulate, 5-partite, unisexual, and generally yellow. The COMMON BRYONY (*B. dioica*), the only British species, is frequent in hedgerows in England, but is not indigenous to Scotland. It has cordate palmate leaves, axillary bunches of flowers, and red berries about the size of a pea. It abounds in a fetid and acrid juice. The root is perennial, very large, white and branched, has a repulsive smell, and is acrid, purgative, and emetic. *B. alba,* common in the middle parts of Europe, possesses similar properties. The root of both is applied topically to bruises, and was formerly very much in use as a purgative. It is now again much employed in homeopathic practice. A decoction made of 1 lb. of the fresh root is said by Withering to be "the best purge for horned cattle." It contains a bitter extractive, called *bryonine,* to which it seems to owe its properties. The young shoots of both species are, however, so free from acrid and dangerous qualities, that they may be used as pot-herbs.—The roots of other species of the genus are also acrid and purgative; but it is said that the root of *B. Abyssinica,* when cooked, is eaten without danger.—BLACK BRYONY (*tamus communis*) is a plant of a different natural order (*dioscoreaceæ,* q.v.). The genus is distinguished by an inferior ovary and succulent fruit. Black B. has long twining stems, cordate undivided leaves, greenish flowers, and red berries. Its roots are very large and fleshy, black externally. The berries are unwholesome, and the whole plant is acrid, the roots so much so as to have been formerly employed for stimulating plasters. But the young suckers, in which the acrid principle is not much developed, are eaten in Greece as asparagus, after careful boiling with change of water, as are also those of *T. cretica.* The plant is common in most parts of Europe, and is found in England, in hedges and thickets

BRYOPHYL'LUM (Gr. *bryon,* moss, and *phyllon,* a leaf), a genus of plants of the natural order *crassulaceæ* (q.v.). *B. calycinum,* a succulent shrubby plant, a native of the Moluccas, with quinate or almost pinnate leaves, oblong deeply crenulated leaflets, and panicles of large pendulous greenish-yellow flowers, is not unfrequent in British hothouses, being regarded as an object of interest, upon account of its producing buds on the edges of the leaves more frequently than almost any other plant. These buds are capable of forming independent plants. This curious mode of propagation is found also in the bog orchis (*malaxis paludosa*), a plant of a very different natural order. See BUD and LEAF.

BRYOZO'A. See ZOOPHYTES.

BRY'UM (Gr. *bryon,* moss), a genus of mosses (q.v.) distinguished by a terminal fruit-stalk, a double *peristome* (see MOSSES)—the outer one of 16 teeth, the inner a membrane cut into 16 equal segments—and a dimidiate *calyptra.* The species are very numerous, and many of them are natives of Britain. They are all small, their stems short, and their leaves forming little rosettes, from the center of which the fruit-stalk springs. They very generally grow in dense patches on wet rocks, wet earth, the bark of trees, etc., beautifully clothing them with bright green.

BRZESC LITEWS'KI, a walled t. of Russia, in the government of Grodno, about 108 m. s. from the city of the same name. Being advantageously situated on the right bank of the Bug, it has an extensive trade. It was the scene of a battle between the Russians and Poles in 1794. Pop. '78, 22,132.

BRZE'ZAN, a t. of Galicia, situated on the Zlota-Lipa, about 54 m. s.e. of Lemberg. It has an old castle and a gymnasium, and manufactures of linen, sail-cloth, and leather. Pop. '80, 10,899.

BUA'CHE, or GARDEN ISLAND, an island of Western Australia, near the mouth of Swan river, in lat. 32° 10′ s., and long. 115° 40′ east. Though measuring only 6 m. by 1, it is yet important as sheltering from the open ocean the deep and spacious anchorage of Cockburn sound, which flows between it and the mainland of the colony.

BUANSUAH, a wild dog of India, conjectured to be the progenitor of the domestic animal. It is very shy, lives in thick woods, and, like the wolf, hunts in packs. In companies of a dozen these animals do not fear to attack the tiger. If captured young they are easily tamed.

BU'AZE, a s. African plant, of which the botanical characters and relations are not yet known, but which is likely to prove of importance on account of its fiber. Dr. Livingstone found it growing in large quantities in the Maravi country, n. of the Zambesi; but he could not procure any specimen in flower or fruit, and Dr. Hooker did not recognize the specimens of branches and leaves. It is not cultivated, and the only use to which it is put by the natives is to afford threads for stringing beads on; but Dr. Livingstone thinks its fiber stronger and finer than flax, and says that a firm thread of it feels like catgut in the hand, and would rather cut the fingers than break.

BU'BALUS, BU'BALIS, or BU'BALÉ, *Antilope bubalus,* supposed to be the *bubalus* of the ancients—although that name is now generally appropriated to the buffalo (q.v.)—a species of antelope, of that section of the genus which is characterized as *bovi*-form or ox-like. The Arabic name is bekker-el-wash, which signifies wild ox. It is an animal about the size of a large stag, with very ox-like head and muzzle—the head, however, remarkably long; the horns about as long as the head, surrounded by a succession of thickened rings, curved so as somewhat to resemble the sides of a lyre, the points directed backward. The general color is yellowish-brown, but the tail is terminated by a black tuft. The B. is an animal of rather coarse appearance, very destitute of the gracefulness of the typical antelopes. It inhabits Barbary, and occasional wanderers make their way to the banks of the Nile. It is figured on the monuments of ancient Egypt. It is gregarious in its habits. It is said to be easily domesticated. The most nearly related species to this, of other antelopes known, is the kaama (q.v.) of s. Africa.

BUBAS'TIS, a goddess of the Egyptians, was, in their mythology, the child of Isis and Osiris, and the sister of Horus. She was identified by the Greeks with Artemis (Diana), though upon what grounds is unknown, as the best information with regard to her is, that she was the goddess who presided over pregnancy and childbirth. The chief temple erected to B. was at Bubastis (q.v.). B. is represented on monuments as having the head of a cat, an animal which was sacred to her.

BUBAS'TIS (the *Pi-beseth* of Scripture, and modern *Tel Basta*), a ruined city of Egypt, about 14 m. n. of Belbeys, in lat. 30° 36′ n., and long. 31° 33′ east. B. derived its name from the Egyptian goddess Bubastis, in whose honor a temple was erected here, which, if not so large and magnificent as some Egyptian temples, was, according to Herodotus, one of the most beautiful, and vast numbers of persons were wont to make annual pilgrimages to it. Nothing but some stones of the temple, which are of the finest red granite, now remain. There are some other ruins, and mounds of great extent, consisting chiefly of the remains of brick houses and heaps of broken pottery.

BUBBLE, as a term, is defined by Blackstone as an unwarrantable undertaking by unlawful subscriptions, subjecting the parties who originate and put them in operation to the penalties of *præmunire* (q.v.). The *South-sea company* (q.v.) was a terrible example of such a bubble.—The BUBBLE ACT is the name given to the 6 Geo. I. c. 18, "enacted," says Blackstone, "in the year after the infamous South-sea project had beggared half the nation," and which public fraud the act was intended to punish. But it was repealed by the 6 Geo. IV. c. 91, which at the same time left such companies to be dealt with by the common law.

BUBBLE SHELL. See BULLA

BUBO, an inflammatory tumor, seated in the groin or the armpit.

BUBO. See OWL.

BUCCANEERS, a celebrated association of piratical adventurers, who, from the commencement of the second quarter of the 16th c., to the end of the 17th, maintained themselves in the Caribbean seas, at first by systematic reprisals on the Spaniards, latterly, by less justifiable and indiscriminate piracy. The name is derived from the Caribbee *boucan,* a term for preserved meat, smoke-dried in a peculiar manner. From this the French adventurers formed the verb *boucaner* and the noun *boucanier,* which was adopted by the English; while, singularly enough, the French used, in preference, the word *flibustier* (see FILIBUSTERS), a corruption of our "freebooter." The B. were also sometimes called "brethren of the coast." The arrogant assumption by the Spaniards of a divine right—sanctioned by the pope's bull—to the whole new world, was not, of course, to be tolerated by the enterprising mariners of England and France; and the enormous cruelties practiced by them upon all foreign interlopers, of which the history of that time is full, naturally led to an association for mutual defense among the adventurers of all other nations, but particularly among the English and French. The fundamental principles of their policy—for they, in course of time, formed distinct commu-

nities—were close mutual alliance, and mortal war with all that was Spanish. Their simple code of laws bound them to a common participation in the necessaries of life; locks and bars were proscribed as an insult to the general honor; and every man had his comrade, who stood by him when alive, and succeeded to his property after his death. The principal center of their wild and predatory life was for some time the island of Tortuga, near St. Domingo. When they were not hunting Spaniards, or being hunted themselves, their chief occupation and means of subsistence was the chase. From the flesh of wild cattle they made their "boucan;" their skins and tallow they sold or bartered to Dutch and other traders. The history of these men embraces, as may be supposed, narratives of cruelty and bloodshed unsurpassed in the annals of crime. It has, however, not a few stories of high and romantic adventure, of chivalrous valor, and brilliant generalship. Among the "great captains" whose names figure most prominently in the records of buccaneering, were the Frenchman Montbars, surnamed by the terrible title of "the exterminator;" his countrymen, Peter of Dieppe, surnamed "the great"—as truly, perhaps, as others so distinguished—and L'Olonnas, Michael de Busco, and Bartolomeo de Portuguez, Mansvelt, and Van Horn. Pre-eminent, however, among them all was the Welshman, Henry Morgan, who organized fleets and armies, took strong fortresses and rich cities, and displayed throughout the bold genius of a born commander. He it was that led the way for the B. to the southern ocean, by his daring march in 1670 across the isthmus of Panama to the city of that name, which he took and plundered after a desperate battle. This brilliant but most unscrupulous personage was knighted by Charles II., and became deputy-governor of Jamaica. A higher subordination of the love of gold to the passion for dominion in him, might probably have made him emperor of the West Indies, some dream of which seems at one time to have occupied his mind. In 1680 and 1689, extensive buccaneering expeditions were made to the Pacific, even as far as the coasts of China, of which the best record is preserved in the lively pages of William Dampier, himself an important partner in these bold adventures. The war between France and Britain, after the accession of William III., dissolved the ancient alliance of the French and English buccaneers. After the peace of Ryswick, and the accession of the Bourbon Philip V. to the Spanish crown (1701), they finally disappeared, to make way for a race of mere cut-throats and vulgar desperadoes, not yet utterly extinct. The last great event in their history was the capture of Carthagena in 1697, where the booty was enormous.—See the *Histories* of Burney and Thornberry, Dampier's *Voyages*, and the *Narratives* of Wafer, Ringrove, and Sharp.

BUCCA'RI, or Bakar, a free port of Austrian Croatia, on an inlet of the gulf of Quarnero, 5 m. e.s.e. from Fiume. It is beautifully situated on the slope of a hill, and has a small but very good and safe harbor, The linen manufacture is carried on here, and ship-building is actively prosecuted; but the inhabitants are principally sailors and fishermen. The tunny fishery is the chief fishery of this part of the Adriatic. The vine is extensively cultivated in the neighborhood of B., and good wine is made. Pop. '69, 2116.

BUCCINA'TOR (from Lat. *buccinare*, to sound a trumpet), the name of a muscle, situated in the substance of the cheeks, it is so called because, when the cheeks are distended with air, the contraction of the B muscles forces it out.

BUCCI'NO, a t. of s. Italy, in the province of Salerno, pleasantly situated on the Botta, which at this point is crossed by an old Roman bridge, about 14 m. e. from Campagna. In its vicinity are quarries yielding fine marble. Pop. '72, 6049.

BUC'CINUM. See Whelk.

BUCCLEUCH'. The Scotts, dukes of B., are one of the oldest and most distinguished families in Scotland. The family traces its descent from sir Richard le Scott, in the reign of Alexander III. (1249–85); but the ancestor who first becomes historically conspicuous is sir Walter Scott of Branxholm and B., a brave and powerful chieftain on the border. B., which from this early period was destined to be associated with the family title, is a lonely estate in the vale of Rankleburn, at the head of Ettrick, Selkirkshire. The sir Walter alluded to flourished in the reign of James V., and on some incidents in his life, his great namesake founded the *Lay of the Last Minstrel.* Sir Walter fought bravely at the battle of Pinkie, 1547, and was slain in an encounter with sir Walter Kerr of Cessford in the streets of Edinburgh, 1552. He was succeeded by his grandson, sir Walter Scott of B., a knight "wise, true, and modest," who was succeeded by his only son, who bore the same name. This sir Walter is celebrated for his military exploits on the border, not the least daring of his enterprises being the rescue of one of his attendants, Kinmont Willie, from the castle of Carlisle. (See *Minstrelsy of the Scottish Border.*) For his services to the state, in which is to be reckoned his carrying away of large numbers of the border marauders to foreign wars, he was raised to the peerage, 1606, as lord Scott of Buccleuch. Dying in 1611, he was succeeded by his only son, Walter, who, in 1619, received an elevation in the peerage, as lord Whitchester and Eskdale, and earl of Buccleuch. Through his son Francis, the second earl, the family, by a grant, acquired the extensive domain of Liddesdale, formerly belonging to the house of Bothwell; also, by purchase, large territories in Eskdale; and in 1642, the barony of Dalkeith from the

Morton family. Francis left only two daughters, the eldest of whom dying without issue, the titles and estates went to her sister, Anne, who, in 1663, was married to James, duke of Monmouth, an illegitimate son of Charles II. In 1673, this pair were created duke and duchess of B., earl and countess of Dalkeith, etc. After a marriage of twenty-two years, the unhappy duke, on a charge of rebellion, was tried and beheaded, 1685; the duchess, however, retaining her honors, title, and estates, as in her own right. The duke left a family of four sons and two daughters. The duchess afterwards married Lord Cornwallis. by whom she had a son and two daughters, and died in 1732, at Dalkeith house, where she had occasionally resided in princely splendor. James, her eldest surviving son, pre-deceased his mother, and his son, Francis, by the death of his grandmother, succeeded to the title of duke of Buccleuch. Notwithstanding the connection with the son of Charles II., the family still preserved the surname of Scott. Duke Francis, in 1743, obtained a restoration of his grandfather Monmouth's earldom of Doncaster and barony of Tynedale, and was hence a British peer. In 1720, he married a daughter of James, second duke of Queensberry, and by this fortunate connection, a portion of the Queensberry estates, along with the dukedom, merged in the family of B. in 1810. Henry, third duke of B., born in 1746, was the greatest and most estimable of his family. He had for his tutor and friend Dr. Adam Smith, and his beneficent talents were directed towards the improvement of his extensive estates in the south of Scotland. The amelioration of the soil, the planting of trees, the making of roads, the improving of the breed of sheep, and the social elevation of his numerous tenantry, uniformly engaged his attention. He died in 1812, and was succeeded by his eldest son, Charles, fourth duke, who, dying in 1814, was succeeded by his son, Walter Francis, born 1806, who bears the title of duke of B. and Queensberry, marquis of Dumfriesshire, earl of Drumlanrig, B., Sanquhar, Dalkeith, etc., in the peerage of Scotland; and earl of Doncaster, etc., in the peerage of England. His eldest son, William Henry, takes the courtesy title of earl of Dalkeith. The duke, like his grandfather, is noted for the improvement of his estates, which in Scotland are situated in Mid-Lothian, Dumfriesshire, Roxburghshire, Selkirkshire, Peeblesshire, Lanarkshire, and stewartry of Kirkcudbright; his farms everywhere being noted for their good steadings and thriving tenantry. As an heritor, the number of churches and school-houses which the duke has been concerned in building is very considerable. He has one small possession in Fife—the island of Inchkeith (q.v). The greatest public improvement ever executed in Scotland by an individual at his own private cost, was carried out by the duke of B. at vast expense. We allude to the creation of the deep-water harbor and port of Granton, on the firth of Forth, 2 m. from Edinburgh. The duke of B. was one of the chief patrons of church livings in Scotland, but waived all claim to compensation when patronage was abolished in 1874. The duke is lord-lieutenant of Mid-Lothian and Roxburghshire, and captain of the Queen's body-guard in Scotland.

BUCEN'TAUR, the name of a ship which acquired much celebrity in Venice at a time when that state was a flourishing republic. A B. was known as early as the end of the 12th c.; and a vessel of the same name was burnt when the French took Venice more than six centuries afterwards; but it is not certain whether this was the same vessel, maintained by being repeatedly patched up with new ribs and planking. The B. is described as having been a galley, about 100 ft. long by 21 in extreme breadth; on a lower deck were 32 banks or rows of oars, manned by 168 rowers; and on an upper deck was accommodation for the illustrious visitors who occasionally came on board. The whole of the fittings were of the most gorgeous character. Although propelled mainly by oars, there were 40 mariners employed in other ways to manage the galley. The B. was employed only once a year, when the doge "married the Adriatic." A splendid water-procession was formed, with the doge and the chief notables in the B., and other distinguished persons in gondolas and feluccas; and when the vessels arrived at the mouth of one of the channels opening into the Adriatic, the doge dropped a ring into the water, using the words: "We wed thee with this ring in token of our true and perpetual sovereignty." This singular ceremony, which took place on Ascension day, arose out of an honor or privilege conferred by the pope on the doge in 1177, consequent on a splendid victory gained by the Venetians over the emperor Frederick Barbarossa.

BUCEPH'ALUS (Gr. meaning "ox-head"), the name of the favorite charger of Alexander the great, was probably also the name of a peculiar breed of horses in Thessaly. According to tradition, Alexander in his boyhood was the first to break in the steed B., and thus fulfilled the condition stated by an oracle as necessary for gaining the crown of Macedon.—The town BUCEPHALIA, on the river Hydaspes, in India, was founded near the grave of B. which died during Alexander's Indian expedition.

BUCER, MARTIN, one of the church reformers of the 16th c., was b. 1491, at Schlettstadt in Alsace. His real name was *Kuhhorn* (cow-horn), but in accordance with the fashion of his time among scholars, he changed it into its Greek equivalent, Bucer being derived from *bous*, an ox, and *keras*, a horn. At the age of 14 he entered the order of Dominicans. At the suggestion of his superior, he went to Heidelberg to study theology, devoting his attention, however, at the same time to the Greek and Hebrew languages. While young he was appointed chaplain to the elector of the palatinate. An acquaintance with the works of Erasmus had already inclined B. toward Protestantism,

and his views were confirmed by the influence of Luther at the Heidelberg disputations in 1518. Following the example given by Luther at the diet of Worms (1521), B. became one of the boldest and most decided of the German reformers. In 1523, he went to Strasburg, where he introduced the doctrines of the reformation. In the disputes between Luther and Zwingli, he adopted a middle course, and endeavored to make reconciliation between them; but his view of the sacraments, which approached that of Zwingli, exposed him to Luther's harsh reprobation. At the diet of Augsburg, where he conducted himself with great circumspection and moderation, he generally accorded with the Lutheran views; but, along with other Stasburg theologians, declined to subscribe to the proposed confession of faith, and afterwards drew up the *Confessio Tetrapolitana*. An agreement, however, was subsequently entered into between B. and the Lutherans, and as a disciple of Luther, he appeared at the religious conference of the reformers held at Leipsic. In consequence of his refusal to sign the *Interim*—a temporary creed drawn up by order of the emperor Charles V.—B. found his situation irksome in Germany, and therefore accepted the invitation of archbishop Cranmer (1549), and came to England to teach theology at Cambridge, and assist Paul Fagius and others in forwarding the reformation. His modesty, blameless life, and great learning gained many friends in England; but his labors were soon interrupted by death, Feb. 27, 1551. His remains were interred in a church at Cambridge with great solemnity; but during the reign of Mary, his bones, with those of Fagius, were taken from their graves and burned in the market-place. His constant attempts to express himself in language agreeable both to Luther and Zwingli, induced in him at times an obscure, ambiguous, and elusive kind of thought, to which, perhaps, Bossuet refers when he stigmatizes B. as "the great architect of subtleties." B. was, of course, exposed to many censures and scandals by the assiduous malice of the Roman Catholic theologians, whose fertile imaginations during the reformation period were exclusively devoted to the manufacture of indecent calumnies; but by Protestant writers he has been highly commended, and by some has been ranked above even Luther and Melanchthon. His best work is a translation and exposition of the Psalms, which he published under the pseudonym Aretinus Felinus (Strasburg, 1529). Hubert intended to edit the whole of B.'s writings in ten volumes, but only one volume appeared (Basel, 1577).

BU'CEROS. See Hornbill.

BUCH, Leopold von, one of the most celebrated of German geologists, was b. at Stolpe, in Prussia, in 1774 or 1777, and received instruction under Werner at the mining academy, Freiburg. He afterwards traveled in pursuit of his favorite science, through all the states of Germany, through Scandinavia, as far as the North cape, and through several parts of Great Britain, France, and Italy, visiting the Canary islands in 1815. His chief writings are—*Geological Observations during Travels in Germany and Italy* (1802–1809); a *Physical Description of the Canary Islands* (1825); *Travels in Norway and Lapland* (1810); and essays *On the Jura in Germany* (1839); and *On the Mountain Systems of Russia* (1840), with several monographs on Ammonites (1832) and other fossils. He was also the author of an excellent geological chart of Germany and its neighboring states, published in 42 plates (2d ed., Berlin, 1832). He died in Berlin, Mar. 4, 1853. B. has been described by an eminent scientific man as "the only geologist who has attained an equal fame in the physical, the descriptive, and the natural history departments of his science. In all these he has been an originator and a discoverer."

BUCH'AN, the n.e. district of Aberdeenshire, consisting of about a fourth of the county, lying between the Ytham and the Doveran. Its surface is undulating, the highest points being Mormond hill in the n., 742 ft., and Dudwick hill in the s., 562 feet. Portions of the coast are bold and precipitous, especially for a few m. e. of the Doveran mouth, where Troup head is 600 ft. high, and s. of Peterhead, where the coasts rise from 70 to 100 feet. Among the rocks five m. s. of this town are the famous Bullers of B., a huge vertical well in the granite margin of the sea, 50 ft. diameter, and 100 ft. deep, into the bottom of which the sea rushes by a natural archway, and, in storms, dashes up the sides with great violence. The eastern parts of B. consist chiefly of granite and gneiss, and the western of clay-slate and old red sandstone. The chief seats of population are Peterhead, Fraserburg, Macduff, and Turriff. B. contains several so-called Druid circles, as well as the remains of the abbey of Deer, and of several castles belonging to the Comyns, who held the earldom of B., but forfeited their title and property in 1309.

BUCHAN, David, 1780–1837; an officer in the British navy who spent many years in explorations in the north polar seas. In 1810, he commanded a schooner on the Newfoundland station, and made a trip up the river of Exploits, the largest stream in Newfoundland. In 1818, he commanded an arctic expedition for the discovery of the north pole. He reached 80° 34′, but was caught in the ice and drifted about between Greenland and Spitzbergen until his vessel was disabled, when he managed to return to England. In 1823, he was commander on the Newfoundland station, and in 1825 high-sheriff of the colony. A few years later he sailed again for the arctic seas, and was never afterwards heard from. He made many important scientific observations concerning the variation of the needle and ocean currents.

BUCHANAN, a co. in n.c. Iowa, watered by tributaries of the Red Cedar river; 576 sq.m.; pop. '70, 17,034; in '80, 18,547. It is tolerably level and well timbered. The Dubuque and Sioux City railroad traverses the co. near the central portion. Productions chiefly agricultural. Co. seat, Independence.

BUCHANAN, a co. in n.w. Missouri, on the Missouri river; 450 sq.m.; pop. '80, 49,824—3731 colored. Five railroads, or their branches, traverse the county. The soil is fertile; productions chiefly agricultural. Co. seat, St. Josephs.

BUCHANAN, a co. in s.w. Virginia, on the Kentucky border, bounded n.w. by the Cumberland mountains; 500 sq.m.; pop. '70, 3777; in '80, 5694. The surface is rough and much of it mountainous. Agriculture is the chief occupation. Co. seat, Buchanan.

BUCHANAN, Va. See page 881.

BUCHANAN, Claudius, d.d., 1766–1815; an English missionary; in 1796, chaplain to the East India company. He wrote *Christian Researches in Asia,* and other works which had much influence in stimulating and supporting missions.

BUCHANAN, Franklin, b. Md., about 1800; a midshipman in 1815, and in 1845 the first superintendent of the U. S. naval academy. In 1855, he was made a capt., and in 1861 had command of the Washington navy-yard. He resigned when the rebellion broke out, but as his state did not leave the union, he asked to be restored. This was refused, and he went over to the confederates, having command of the *Merrimac* in the attack upon the union fleet in Hampton Roads, in which engagement he was wounded. Two years later, as admiral he commanded the confederate fleet so thoroughly defeated by Farragut in Mobile bay. On that occasion he was wounded and taken prisoner, but released when the war closed. He d. 1874.

BUCHANAN, George, one of the most learned men of the 16th c., and a distinguished poet and historian, was b. of poor parents in Killearn, in the co. of Stirling, in Feb., 1506. He was sent to the university of Paris by his uncle, who died two years afterwards, leaving B. without the means of prosecuting his studies. He returned home, served in one campaign against the English, and entered St. Andrews university in 1524, where, in the following year, he took his degree of b.a. In 1526, he went to Paris, and became a student in the Scots college there. He subsequently obtained a professorship in the college of St. Barbe, but returned to Scotland about 1537. During his residence on the continent, B. adopted the tenets of the reformed faith. A satire entitled *Somnium,* exposing the Franciscans, brought down upon him the wrath of the priests; and he had resolved upon seeking safety in his old college at Paris, when king James V. took him under his protection, and intrusted him with the education of one of his illegitimate sons. At the request of the king, B. wrote another and more pungent satire against the monks, entitled *Franciscanus,* increasing their anger, and rousing especially the bitter hatred of the powerful cardinal Beaton, who after a time procured B.'s arrest, and even went so far as to offer the king money for his life. Though to James was entirely due the publication of the offensive satire, he did not interfere to protect the poet, who, however, contrived to effect his escape to Paris. After spending some years at Bordeaux and Paris in tuition, he accompanied the learned Portuguese, Govea, to the university of Coimbra, in Portugal, as one of his associates. After the death of Govea, B. was arrested as a heretic, and was for some time detained in a monastery, where he began his splendid Latin metrical version of the Psalms. In 1551, being restored to liberty, he went to England; but soon afterwards went to Paris. About 1560, he returned to Scotland, where he made an open confession of Protestantism. His reputation as a scholar gained for him a good reception at the court of the young queen, Mary, whose classical tutor he became. But his religious and political principles attached him to the party of the regent Moray, by whose influence he was appointed principal of St. Leonard's college, in St. Andrews university, in 1566. In the following year, he was chosen moderator of the general assembly—a very high honor for a layman. The doings of Mary, which scandalized the Scottish public, disgusted her tutor also, and he accompanied the regent Moray to England, in order to give evidence against her before the commissioners appointed by Elizabeth to inquire into her guilt. His *Detectio Mariæ Reginæ,* laid before these functionaries, was industriously circulated by the English court. In 1570, B. was appointed tutor to the young king, James VI. (afterwards James I.), who owed to him all the erudition of which in later life he was so vain. No considerations of the future position of his pupil were allowed to interfere with B.'s treatment of him, which was strict, if not even stern; and in dedicating his *De Jure Regni apud Scotos* to the young monarch in 1579, he warned him against favorites with a freedom remarkable not only in a subservient but in any age. In 1570, B. was appointed director of chancery, which he soon resigned, and in the same year was made keeper of the privy seal, an office which he retained until within a short time of his death. The latter years of his life were devoted to the composition of his *History of Scotland* (published in 1582). He died thirty days after its publication, on the 28th Sept., 1582, and was buried in Greyfriars churchyard, Edinburgh. As a scholar, B. was unrivaled in his age; and he wrote Latin poetry "with the purity and elegance of an ancient Roman." He was alike humorous, sarcastic, and profound. His *History,* written in Latin, is remarkable for the richness, force, and perspicuity of its style, though it has been found fault with for the partiality of its narration of contemporary events; and two years after the author's death, it, as

well as *De Jure Regni*, etc., was condemned by the Scottish parliament, and every person possessed of copies was ordered to surrender them within 40 days, in order that they might be purged of "the offensive and extraordinary matters" they contained. Two collected editions of B.'s works have been published—one by Ruddiman in 1715, 2 vols. folio; and another by Burman, Leyden, in 2 vols. quarto, in 1725. The translations that have yet appeared are far from doing justice to the original.

BUCHANAN, JAMES, a distinguished American statesman, was b. in Franklin co., Penn., April 13, 1791. He was educated at Dickenson college, adopted the profession of the law, and, in 1814, was elected a member of the Pennsylvanian house of representatives. In 1820, he was chosen a member of congress, and remained so till Mar. 4, 1831. In May of that year, he was nominated ambassador to Russia. He returned to the United States in 1834, and soon after was elected a member of the senate; he was re-elected in Dec., 1836, and 1843. Appointed by president Polk, in Mar., 1845, secretary of state, he held that office till the close of Polk's presidency. Ambassador to England in 1854, B. resigned that post the following year, and in 1856 was elected president of the United States. His administration was, on the whole, popular. He was in favor of the maintenance of slavery, but when the civil war broke out he warmly embraced Lincoln's policy. He died June 1, 1868.

BUCHANAN, JAMES (*ante*), the 15th elected president of the United States, filling the 18th presidential term (1857–61); b. at Stony Batter, Franklin co., Penn., April 22, 1791; d. Lancaster, Penn., June 1, 1868. He was the son of an Irish emigrant and an American mother, educated at Dickinson college, bred to the law, and admitted to practice in 1812. Though a professed federalist, he served as a private in the war with England. In 1814, he was a member of the Pennsylvania legislature, and in 1820 was elected to congress, where he served through five terms. In 1828, he favored Jackson for president, and in the congress of 1829–31 was chairman of the committee on the judiciary. After leaving congress, Jackson sent him as minister to Russia, where he concluded the first commercial treaty between the two countries, securing valuable privileges in the Black and Baltic seas. In 1833, he was chosen to the United States senate, where he supported Jackson, especially in the claim that appointments might be made by the president alone when the senate was not in session. When it was proposed to exclude from congress petitions for the abolition of slavery, B. desired to prevent even the discussion of slavery by congress, proposing to leave the matter solely to the slaveholding states, and holding that congress had no power over it. He favored the recognition of Texan independence, and the annexation of that republic to the United States. In the affair of the French indemnity, he supported Jackson's demand for payment or war. During Van Buren's administration Buchanan supported the independent treasury scheme; favored the preemption of public lands, and opposed the bill to prevent the interference of federal officers in elections. He sustained the veto power under Tyler, and opposed the ratification of the Ashburton treaty, which settled the dispute concerning the northern boundary. When the question of the annexation of Texas came to the senate there were but 15 votes in its favor, but the measure was carried in the form of joint resolutions only three days before the close of the term of congress. B. was the only member of the senate committee of foreign affairs to report in favor of annexation. Polk made him secretary of state. In this position he had to deal with the north-western boundary question, whence arose the famous partisan cry "54° 40′ or fight." Both England and the United States had formally claimed the territory between the Pacific coast and the Rocky mountains up to the Russian boundary, but after much negotiation the line of 49° n. lat. was agreed upon. During the war with Mexico, B. was busy in avoiding or preventing the interference of other nations. He was in private life during the discussion and adoption of the compromise measures of 1850, but fully approved them. When Pierce came into office in 1853, he sent B. as minister to Great Britain, where he was engaged in endeavors to settle a series of questions concerning Central American affairs. In the course of these duties he was present at the Ostend conference, the object of which was to bring about the sale of Cuba to the United States; but nothing resulted beyond talk. In April, 1856, B. returned to the United States, and in June was nominated for president by the democratic party. The electoral vote was: for Buchanan, 174; for John C. Fremont (candidate of the newly organized republican party), 114; for Millard Fillmore (native-American), 8. The popular vote was: Buchanan, 1,838,169; Fremont, 1,341,264; Fillmore, 874,534; majority against Buchanan, 377,629; plurality for him, 496,905. He had the votes of every slaveholding state except Maryland, which went alone for Fillmore. The vote for Fillmore also gave Buchanan California and New Jersey. In the executive chair his effort was to smother and put out of sight the agitation concerning slavery not only in new states, but everywhere. Among other acts of his administration was the temporary pacification of the Mormon troubles, and the vetoing of the homestead bill. After Lincoln's election, B. was more than ever anxious to suppress the slavery discussion, and pointedly accused the north, in his last message to congress, as to blame for the impending disorder, because of that discussion, which had "produced its malign influence on the slaves, and inspired them with a vague idea of freedom." While holding that the executive ought to take care that the laws be faithfully executed, he shrank before the secession of South Carolina, declaring that he could not employ force except upon the demand of the lawful authorities of the state.

and in South Carolina no such authority then existed. His argument was that, if a state had withdrawn, or was even attempting to withdraw, from the union, there was no power in the constitution to prevent the act. A few days later he was confronted by commissioners from South Carolina (that state having passed an act of secession on the 20th Dec., 1860), who came to demand the surrender by the president to the seceded state of all public property, and to negotiate for the continuance of "peace and amity between that commonwealth and the government at Washington." His reply was that he had no power, and could only refer the matter to congress; he could only receive them as "private gentlemen of the highest character," and treat respectfully such propositions as they might make. He did, however, decline to accede to their demand for the removal of the troops from Charleston harbor. The cabinet immediately broke up. Gen. Cass was secretary of state, but resigned when the president refused to order reinforcements to the Charleston ports; the secretary of the treasury and the secretary of the interior had already gone; Floyd, secretary of war, resigned because the president refused to withdraw the troops. The last official act of president Buchanan of any importance was characteristic of his whole course where the south and its institutions were concerned. It was embodied in a letter from the secretary of war (Holt) to the governor of South Carolina (Jan. 15, 1861), which declared, "by order of the president," that "the forts in that state, in common with the other forts, arsenals, and property of the United States, are in charge of the president, and that if assailed, no matter from what quarter or under what pretext, it is his duty to protect them by all the means which the law has placed at his disposal;" adding that it was not his present purpose to garrison the forts, as he "considered them entirely safe under the protection of the law-abiding sentiment for which the people of South Carolina had ever been distinguished; but should they be attacked or menaced with danger of being seized or taken from the possession of the United States, he could not escape from his constitutional obligations to defend and preserve them." After the installment of his successor, B. retired altogether from public affairs, but a year or two after the rebellion had been put down, he published a defense of his administration and the measures he adopted for the preservation of peace. He was never married.

BUCHANAN, Robert, b. 1841; a poet of Scotland, educated at Glasgow university. In 1860, he published *Undertones*, a volume of verses; in 1865, *Idyls* and *London Poems*. In the same year he edited *Wayside Posies*, and translated ballads from the Danish. Among later works are *Napoleon Fallen—a Lyrical Drama; The Land of Lorne, including the Cruise of the Fern to the Outer Hebrides; The Drama of Kings; On the Fleshly School of Poetry* (a severe criticism of some living English poets); *Master Spirits; A Mad Prince* (acted at the Haymarket); and his poems collected in 3 vols. in 1874.

BUCHANAN, Robert C. See page 881.

BUCH'ANITES, an extraordinary sect of fanatics, which sprang up in the w. of Scotland in 1783, but has now become extinct. The founder of the sect was Mrs. or Lucky Buchan, b. in Banffshire in 1738, of humble parentage. Her maiden name was Elspeth Simpson. She early fell into habits of vice, but with her licentiousness were combined a sort of religious fervor and extreme antinomian opinions. In 1782, being resident in Glasgow with her husband, a potter, who ultimately divorced her, she became acquainted with the Rev. Hugh White, minister of the Relief congregation in Irvine, a weak vain man and coarse declamatory preacher, who adopted her opinions, for which he was deposed by his presbytery, and began along with her to found a new sect in Irvine. Popular tumults arose, which led to her expulsion from the town in May, 1784. Mr. White and his wife, with other devoted adherents, male and female, accompanied her, regarding her as a divinely commissioned person, and expecting her to lead them to the place where Christ was speedily to appear again on earth. She was addressed as "friend mother in the Lord," and among other more blasphemous pretensions, gave herself out to be the woman mentioned in Rev. xii., White being represented as the "man-child" whom she had brought forth. She and her followers traveled towards Nithsdale, and found a resting-place in a barn at New Cample, near Thornhill, where they afterwards built for themselves a house of one apartment with a loft, in which they all dwelt, supported chiefly by the money of the more wealthy of their number. A few additional persons joined them. They lived in expectation of being translated to heaven without death; and on one occasion, after a fast of extraordinary duration, by which many of them were reduced to a very spectral condition, were led out by their prophetess to a hill-top to be immediately taken up, but returned disappointed. After this, dissensions began to arise among them; and some, recovering from their infatuation, left the society. Their expected heaven was one of mere sensual delights; and it is now sufficiently ascertained that they lived in unrestrained sexual intercourse—for they condemned marriage as unworthy of Christians—and that they systematically practiced infanticide. Yet they were protected from the outbreakings of popular indignation, and no investigation was made by the authorities. On the failure of their means of subsistence, they took a farm in a moorish part of the stewartry of Kirkcudbright; and those who remained of them accumulated by their industry the means of purchasing a small property, on which was built the first house of the village of Crocketford, where they finally became extinct, the last of them surviving till 1846, full even in his old age of the strange delusions of his youth, and preserving in his house

the bones of Lucky Buchan, which were buried with him in his grave.—See *The Buchanites from First to Last*, by Joseph Train. (Edin. 1846.)

BUCHAN-NESS', the easternmost promontory of Scotland, in the n.e. of Aberdeenshire, 3 m. s. of Peterhead, in lat. 57° 28′ n., and long. 1° 46′ west. A light-house, 130 ft. high, with a revolving light, has been erected here. It may be stated that the low rocks at Peterhead stretch a little further e. than the Buchan-ness. In the sea off the B. lie the Buchan Deeps, a great trough 50 to 90 fathoms deep, and 25 m. broad, and stretching s. nearly as far as the Bell-rock. Outside lie the Long Forties, a bank at the depth of 35 to 45 fathoms, and 10 to 20 m. broad.

BUCHAREST', Bukharest', or Bukhorest', the chief city of Wallachia, and capital of Roumania, in a rich and extensive plain on the Dumbovitza, a tributary of the Argish, in lat. 44° 26′ n., and long. 26° 5′ east. The town is for the most part meanly built, and the streets are very irregular and generally unpaved. There are, however, some handsome hotels; and the churches are numerous and many-spired, giving to the place a picturesque appearance. The prince's palace, a large structure in the center of the town, has no claim to architectural beauty. The number of cafés and gambling-tables is excessive; and altogether B. has the unenviable reputation of being the most dissolute capital in Europe. The *corso*, or public promenade, is a miniature Hyde Park. B. is the entrepot for the trade between Turkey and Austria, the chief articles of commerce being grain, wool, salt, honey, wax, building-timber, and cattle. It has some small manufactures of woolen cloths and carpets. B. has at various times suffered considerably at the hands of the Russians, and is remarkable as the place where in 1812 a treaty was concluded between Turkey and Russia, by which the former ceded to the latter the province of Bessarabia and a portion of Moldavia; Russia waiving her claim to all other territories she had conquered. This treaty also defined the Pruth as the boundary-line between the two empires. During Crimean campaign, B. was successively occupied by Russians, Turks, and Austrians. Pop. '66, 141,754; '75, estimated 250,000.

BUCHEZ, Philippe Benjamin Joseph, a French physician, writer, and president of the national assembly in 1848, was b. in 1796 at Matagne la Petite, in the department of Ardennes, and studied medicine in Paris, 1815. He became involved in several plots against the Bourbons, was active in the conspiracy of the French Carbonari (q.v.), and supported the doctrines of St. Simon (q.v.); but, after editing for some time the communist journal *Le Producteur*, he separated from his colleagues. Curiously enough, during all his active career of underhand politics, he was prosecuting his learned studies, and in 1825 published a *Précis Elémentaire d'Hygène*, besides editing the *Journal des Progrés des Sciences et Institutions Médicales*. After the revolution, 1830, B. established and conducted the journal *L'Européen*, the organ of Neo-Catholicism; and in concert with M. Roux Lavergne, began a republican history of the French revolution. All his writings are marked by original views and arguments in favor of the belief in human progress. After the Feb. revolution, 1848, B. was made president of the national assembly; but by his want of energy during the disturbance of May 15, he incurred the censure of all parties. On the inauguration of the empire, B. returned to his studies. He died in 1866.

BUCHHOLTZ, REINHOLD. See page 881.

BUCHNER, Friedrich Karl Christian Ludwig, b. 1824; a German atheistic philosopher. He was a practicing physician, in the school of Tubingen, whence he was removed because of his publication of the doctrine that nothing beyond material force is known to man (published in English as *Force and Matter*). The main ideas of his doctrines are the eternity of matter, the indestructibility of force, the co-existence of light and life, and the infinity of forms of being in time and space. His works have been widely circulated in his own and other languages. *Licht und Leben* was pub. '82.

BUCHU. See Bucku, *ante*.

BUCK, a name sometimes distinctively appropriated to the male of the fallow deer (q.v.), the female of which is a *doe*. But the term B. is often also applied to the male of other species of deer, as of the roebuck (q.v.), although never to that of the red deer (see Deer), which, when mature, is a Stag or a Hart.

BUCK, Dudley. See page 881.

BUCK, Gurdon, m.d. See page 881.

BUCKAU, a t. in Saxony on the Elbe, adjoining Magdeburg; pop. '71, 9696. It has extensive machine works, and several important manufactories.

BUCKBEAN, or Marsh Tre'foil (*Menyanthes trifoliata*), a plant of the natural order *gentianeæ* (q.v.), the only known species of its genus, widely distributed in all the colder parts of the northern hemisphere, and common in Britain. It has been described as "perhaps the most beautiful" of all British plants. It grows in marshy places, its creeping root-stalks (or rhizomes) and densely matted roots often rendering boggy ground firm. The leaves are ternate, like those of the trefoils or clovers, and are supported on pretty long stalks. The flower-stalk bears a compound raceme of 10 to 20 white flowers, externally tipped with red. The calyx is 5-parted; the corolla funnel-shaped, with a spreading 5-lobed limb, shaggy on the inner surface, with thick fleshy hairs. The fruit is a one-celled, two-valved capsule. The leaves are destitute of smell, but very bitter. From them is prepared a valuable bitter extract, which has long been used in cases of dyspepsia and disorders of the bowels, and which was also formerly employed in intermit-

tent fevers. An infusion is also sometimes used, and sometimes the dried and powdered leaves. The whole plant seems to possess the same bitter and tonic properties. It is sometimes used in Germany as a substitute for hops. The root-stock, however, which is black and jointed, contains a considerable quantity of a kind of starch, which is separated from the bitter substance, and used as food in some of the northern parts of Europe.

BUCKEYE. See HORSE CHESTNUT.

BUCK-HOUND, a hunting-dog once common in Britain, when buck-hunting was a most fashionable amusement, but of which few packs now exist. The buck-hound resembles a dwarf STAG-HOUND (q.v.), and possesses great strength and perseverance. Bucks are, however, often hunted by other kinds of hounds.

BUCKINGHAM, a co. in central Virginia on the James and Appomattox rivers, traversed by the James canal; pop. '80, 15,540—8715 colored. The surface is hilly, but the soil near the rivers is good. There is a gold mine near Willis mountain, and iron and slate are found. Co. seat, Marysville.

BUCKINGHAM, the old co. t. of Buckinghamshire, in the n. part of the shire, is situated on the Ouse—which flows round the town, and has three bridges. B. is 61 m. n.w. of London by rail. It returns one member to parliament. Pop. '81, 6859. Bobbin lace is the chief manufacture, but it is on the decline. B. is a place of considerable antiquity. Edward the elder fortified it in 978, and the Danes captured it in 1010. The earls of Buckingham built a castle here soon after the Norman conquest. Edward III. made it a staple for wool. Here Catharine of Aragon received the news of the battle of Flodden, and Charles I. had his head-quarters in B. for a few days in 1644.

BUCKINGHAM, Duke of, GEORGE VILLIERS, the favorite of James I. and Charles I. of England, third son of sir George Villiers, was b. at his father's seat of Brookesley, Leicestershire, Aug. 20, 1592. Knighted in April, 1616, and sworn a gentleman of the bedchamber on Jan. 1, 1617, he became master of the horse and a knight of the garter. Created the same year baron of Whaddon and viscount Villiers, and in Jan. following earl of B., and sworn of the privy-council, he was next made a marquis, and appointed lord-admiral of England, chief-justice in Eyre of parks and forests s. of the Trent, master of the king's bench office, high steward of Westminster, and constable of Windsor castle. In 1620, he married the daughter of the earl of Rutland, the richest heiress in the kingdom. In 1623, while negotiations were in progress with the Spanish court for a marriage between the infanta and the prince of Wales, afterwards Charles I., B. persuaded the latter to go himself to Madrid and prosecute his suit in person. The ultimate failure of the negotiations has been ascribed to B.'s arrogance. In his absence he was created a duke, and on his return nominated lord-warden of the cinque ports, and steward of the manor of Hampton court. By his advice, James declared war against Spain. On the accession of Charles I., in 1625, B. maintained his ascendency at court, but after the ill-fated expedition against Cadiz, he became odious to the nation, and was saved from impeachment only by the king's dissolving parliament. The treaty for the marriage of Charles with the princess Henrietta of France was concluded by him, but he was not allowed to return to Paris, in consequence of his audacity in lifting his eyes to the French queen. In 1627, with an armament of 100 sail and 7000 soldiers, he appeared before Rochelle, then in possession of the Huguenots, who refused him admission within the harbor. His troops then made an ill-conducted descent on the neighboring isle of Rhé, and returned to England beaten and disgraced. He soon after undertook a second expedition to Rochelle, and proceeded to Portsmouth for embarkation, when he was assassinated by a discontented subaltern-officer, named Felton, Aug. 23, 1628, in his 36th year.

BUCKINGHAM, 2d Duke of (GEORGE VILLIERS), a brilliant but profligate nobleman, son of the preceding, was b. at Wallingford house, Westminster, Jan. 30, 1627, and studied at Cambridge. On the outbreak of the civil wars, he served in the royal army; his estates were confiscated by the parliament, and he took refuge on the continent. He attended Charles II. into Scotland, and after the battle of Worcester, in 1651, went again into exile. Returning secretly into England, he married, in 1657, the daughter of lord Fairfax, the parliamentary general, to whom his forfeited estates had been assigned. Arrested by Cromwell, and committed to the Tower, he was afterwards removed to Windsor castle, but released on the abdication of Richard Cromwell. At the restoration, he recovered his estates, and was made master of the horse, and sworn of the privy-council. He was mainly instrumental in the fall of the chancellor, Clarendon, whom he made an object of ridicule to the king, and was one of Charles's confidential ministers, who, from the initial letters of their titles, were called "the Cabal." Engaging in 1666 in some treasonable practices for effecting a change in the government, he was deprived of all his offices at court, but, on his submission, soon recovered them. In 1670, he was sent ambassador to France, and was employed on some other embassies. He was elected chancellor of the university of Cambridge in 1671. Supporting the non-conformists in 1674, he opposed the test act, and was deeply engaged in the popish plot. After Charles's death, in 1685, B. retired to his manor of Helmsley, in Yorkshire, and amused himself with the chase. He died at Kirkby-Moorside, April 16, 1688, and was

interred in Westminster abbey. The manufacture of glass and crystal is said to have been introduced into England from Venice by him. B. was the author of several stage-plays, of which the best is *The Rehearsal*, a comedy; *A Satire against Mankind;* and some poems.

BUCKINGHAM, James Silk, a modern traveler and popular lecturer, the son of a farmer, b. in 1786, at Flushing, near Falmouth, Cornwall; when a boy, went to sea, and made several voyages to Lisbon. After years of unsettled and wandering life, he, in 1816, established a journal at Calcutta, but the boldness of his censures on the Indian government led to his expulsion from the presidency of Bengal. His lectures, on his return to England, against the East India company monopoly, and in support of opening the trade to China, tended greatly to direct public attention to the subject. In London, he established *The Oriental Herald*, and *The Athenæum*, now the leading weekly literary journal. Subsequently, he traveled through the United States, and from 1832 to 1837 was M.P. for Sheffield. He was projector and secretary of the British and foreign institute, literary club, 1843–1846; and president of the London temperance league, 1851. B. was the author of numerous works of travel on the continent, in the east, and in America. He was engaged on his autobiography, two volumes of which were published before his death, which took place June 30, 1855.

BUCKINGHAM, Joseph Tinker, 1779–1861; an American journalist, native of Connecticut. He was bred a printer, and in 1800 went to Boston, where, six years later, he began *The Polyanthus*, a monthly magazine, which was soon suspended, but resumed in 1812. In 1809, he published a weekly called *The Ordeal;* from 1817 to 1828, *The New England Galaxy and Masonic Magazine;* and, in 1831, *The New England Magazine.* In 1824, he started the *Boston Courier*, of which he was editor until 1848. On the 24th of June, 1840, he presided over the celebration (in Boston) of the four hundredth anniversary of the invention of printing. As an editor he was a vigorous writer, but rather bitter and personal. He was several times elected to the legislature. Besides his ordinary work, he published *Specimens of Newspaper Literature, with Personal Memoirs, Anecdotes, and Reminiscences*, and *Personal Memoirs and Recollections of Editorial Life.*

BUCKINGHAM, William Alfred, ll.d., 1804–75; the "war governor" of Connecticut (1858–66), noted for his zeal and untiring energy in support of the union cause during the rebellion. Before his election as governor he was a carpet manufacturer and merchant. In 1869, he was elected U. S. senator. Among his benefactions was $25,000 to the theological school of Yale college.

BUCKINGHAM, or BUCKINGHAMSHIRE, John Sheffield, Duke of; 1649–1721; son of the second earl of Mulgrave. In the war with Holland, he served in the navy and commanded a ship; and afterwards, in the land forces, he joined Turenne to study the art of war. James II. made him lord chamberlain and one of the privy council. He acquiesced in the revolution and was in the cabinet of William III.; and, on the accession of Anne, with whom he was a personal favorite, he received the privy seal and became lord lieutenant of the North Riding of Yorkshire. He sided with the tories, and held last the dignity of lord president. He wrote two tragedies, and an essay on poetry, and one on satire.

BUCKINGHAMSHIRE, a south-midland county of England, its greatest length being about 54 m., its average breadth 18, and total area 738 sq. miles. The plastic clay tertiary strata occupy the southern parts of the county, which is finely diversified with hill and dale, wood and water. To the n. is a broad chalk-band, including the Chiltern range of chalk-hills, which enter from Oxfordshire, and stretch across the county in a n.e. direction into Bedfordshire, partly covered with heath and wood, and near Ivinghoe and Wendover, above 900 ft. high. Sloping n. from these hills, and crossed by narrower bands of greensand and oolite, is the extensive, and very fertile vale of Aylesbury, watered by the Thame. The chief rivers are the Thames, bordering the county on the s.w., the Ouse, Ousel, Colne, and Thame, the latter two falling into the Thames. The Grand Junction canal, and the Great Western and North-western railways, intersect the county on the e. and south. The climate of Bucks is mild and healthy; the soil is mostly good, chalk and clay predominating. About half the county is under tillage, the rest in meadows and pasture. The agriculture is not equal to the capabilities of the land, which is often overcropped and exhausted. The farms are generally small, averaging 200 acres. The cottages are generally good. Wheat and beans are the principal crops. The chief dairy product is butter, of which four to five millions of pounds are annually sold, chiefly in London. In the vale of Aylesbury, fattening of cattle is extensively carried on; the sheep are noted for their fine and heavy fleeces; and large numbers of ducks are reared for metropolitan consumption. In 1875, the number of cattle in the county was 68,831; sheep, 292,383; and pigs, 35,370. Beech and oak are the chief timber-trees, but box and juniper are also grown. The chief manufactures are paper, straw-plait, and thread-lace. B. returns 8 members to parliament—3 for the county and 5 for the boroughs. The chief towns are Aylesbury, Buckingham, Marlow, and Wycombe. B. contains some Roman and British remains, as traces of Watling, Ickneld, and Akeman streets or ways. The chief ecclesiastical ruins are those of Miss-

enden and Notley abbey, the latter of which has been converted into farm-buildings. There are many examples of early English and decorated architecture. The church of Chetwode, near Buckingham (13th c.), contains some very fine examples of ancient glass-staining. Many events of historical interest occurred in this county. It was the scene of contest in the civil wars of Stephen and John. At Chalfont St. Giles, Milton finished his *Paradise Lost*, and at Horton, he wrote *L'Allegro*. At Hampden lived the great patriot of that name; Waller was proprietor of Beaconsfield manor; Atterbury was born at Milton; Stoke Poges churchyard suggested Gray's *Elegy*, and is the place of his burial; at Olney, Cowper lived; at Gregcries, near Beaconsfield, Burke died and was buried; Scott, the Biblical commentator, was rector of Aston Sandford; Herschel's great telescope still stands at Slough, where he made most of his important discoveries; and at Stowe is a magnificent mansion—one of the finest in England, alike for extent, architecture, and beauty of site—formerly belonging to the duke of Buckingham. Pop. '71, 175,879 ; '81, 176,277.

BUCKLAND, Cyrus, b. Conn., 1799; a successful inventor, pattern-maker of the U. S. armory at Springfield, Mass., and designer of machinery for making arms. He has produced many new machines and tools in the line of arms manufacturing.

BUCKLAND, Francis Trevelyan, a son of the rev. Dr. Buckland (q.v.), b. at Christ Church college, Oxford, Dec. 17, 1826. He was educated at Winchester school, and at Christ Church college, Oxford. He devoted himself to the study of medicine; and after being house-surgeon of St. George's hospital, London, was appointed assistant-surgeon to the 2d life-guards in 1854, retiring in 1863. From his boyhood, he manifested an enthusiastic delight in natural history, especially when it could be applied practically to the cultivation of useful quadrupeds, birds, or fish, in which study he was encouraged and guided by his father. He has contributed a vast number of brief papers on various branches of his favorite science to the *Times*, *Field*, *Queen*, *Land and Water* (of which he was editor), etc. He was also the author of *Curiosities of Natural History* (Lond. 1857; second series, 1860; third series, 2 vols., 1866); of a work entitled *Fish-hatching* (Lond. 1863); and *Logbook of a Fisherman and Zoologist* (1876); and editor of a new edition of his father's Bridgewater treatise (Routledge, 1858); and of *White's Selborne* (1876). He was first secretary to the acclimatization society of Great Britain and Ireland. He was an acute observer, and his writings on subjects of natural history in great part exhibit the results of fresh and original observations, which his sprightly style exhibits in a most interesting manner. He had long taken a great interest in fish-culture, and had been actively concerned in the recent endeavors to promote it in England. He had, at his own cost, established under the science and art department, South Kensington, a "museum of economical fish-culture," illustrating the natural history of salmon and sea-fish by means of plaster-casts, which he made with his own hands, and by preparations and dissections in spirits. In 1867, B. was appointed inspector of salmon fisheries for England and Wales, and, in 1870, special commissioner on the salmon fisheries of Scotland, and in 1877 on the Scotch herring fisheries. He d. 1880.

BUCKLAND, William, D.D., a distinguished geologist, whose labors tended greatly to the advancement of science, was born at Axminster, Devonshire, England, in 1784. Educated at Winchester and Oxford, he was appointed, in 1813, reader in mineralogy in Oxford university. The same year, he was elected a fellow of the geological society, and he was twice its president. In 1818, he became reader in geology at Oxford, and was elected fellow of the royal society. In 1822, he received the Copley medal for an account of an assemblage of fossil teeth and bones of 22 different animals, discovered in a cave at Kirkdale, Yorkshire; and, in 1823, he published a treatise founded on it, entitled *Reliquiæ Diluvianæ, or Observations on Organic Remains, attesting the Action of a Universal Deluge*, a theory which he afterwards saw cause to modify. In 1825, B. was appointed a canon of Christ church, Oxford. In 1827, he was chosen a member of the council of the royal society; in 1832, he was elected president of the British association at Oxford, its second meeting; and, in 1836, he published his Bridgewater treatise, *Geology and Mineralogy Considered with Reference to Natural Theology* (2 vols. 8vo). To the transactions of the geological society he contributed many valuable papers; and his sketch of the structure of the Alps, in the *Annals of Philosophy*, is esteemed one of the most interesting of his geological writings. In 1845, he was made dean of Westminster, and, in 1847, a trustee of the British museum. Under his great and continuous labors to benefit others, his mental faculties gave way some years before his death, which took place Aug. 14, 1856.

BUCKLANDIA, a magnificent and beautiful evergreen tree of the natural order *hamamelideæ* (see Witch-Hazel), a native of the mountains. It grows unbranched to the height of 40 ft., the trunk sometimes 21 ft. in girth at 5 ft. from the ground. The foliage is thick, bright, and glossy. The timber is not valuable. Dr. Hooker thinks that this tree would probably succeed in the mild climate of the w. of England.

BUCKLE, Henry Thomas, an author who attained a sudden notability in 1857 by the publication of the first volume of a work entitled *The History of Civilization in England*. He was born at Lee, in Kent, Nov. 24, 1823, and was for a very short time at Dr. Holloway's school in Kentish-town, near London. No other school and no

university claims credit for his education, which, nevertheless, was in the highest degree liberal. An easy fortune and a large library enabled Mr. B. to gratify, without any sort of impediment or restraint, an all-absorbing love of letters. After bringing out a second volume of his work in 1861, he undertook a journey to the east, in order to restore his health and extend his knowledge. Having spent the winter in Egypt, he went over the desert to Syria, caught typhus fever by the way, and died at Damascus, May, 1862.

B.'s plan involved, before tracing the particular history of English civilization, a general consideration of the progress of those European countries, England, France, Germany, Scotland, Spain, and America, in which the elements of modern civilization are originally found. The two volumes published are occupied with this preliminary examination, which they do not even complete. His objects, however, are clear. They are (1) to discover what is the essential spirit of a nation's history apart from particular men and events, and (2) to trace out the causes of the progress which has been made in England and France. Under the first head B. endeavors to show that the spirit or character of a people is dependent on material circumstances, such as soil, climate, food, aspect of nature, and the like, and to be sought for in these; under the second head occurs the theory, the vigorous application of which by B. has startled and offended many readers—viz., that the progress of society depends upon skepticism; that the retarding force is credulity; and that the excessive "protection" exercised by governments, the nobility, the church, etc., over the "people," has dwarfed and held back the spirit of freedom and civilization. These and other positions are defended by B. with great ingenuity and lucidity of argument and expression, and have been admitted, even by his opponents, to contain much sound truth. He is accused—perhaps not unjustly—of being often one-sided, and of drawing sweeping deductions from an imperfect survey of the facts. He is said to have been one of the best chess-players in the world. See his *Miscellaneous and Posthumous Works*, edited by Miss Helen Taylor; and *Pilgrim Memories*, by J. S. Stuart Glennie.

BUCKLER, in old armor, was a kind of shield worn on the left arm. The bucklers worn by the *hastati*, or spearmen, among the ancient Romans, were about 4 ft. long, by 2½ in width, made of boards, covered on the inside with linen and sheepskin, and on the outside with iron plate. In the middle ages the B. was round, oval, or square in shape, and was frequently made of wicker-work or of hide, strengthened by metal-plates.

BUCKLES, metal instruments, consisting of a rim and tongue, used for fastening straps or bands in dress and harness. The use of B., instead of shoe-strings, was introduced into England during the reign of Charles II. They soon became very fashionable, attained an enormous size (the largest being called Artois buckles, after the comte d'Artois, brother of the king of France), and were usually made of silver, set with diamonds and other precious stones. In the latter half of last century the manufacture of B. was carried on most extensively in Birmingham, there being at one time not less than 4000 people employed in that town and its vicinity, who turned out 2,500,000 pairs of B. annually, at the average value of 2*s.* 6*d.* per pair. When the trade was at its height, however, fashion changed, and in 1791 we find buckle-makers petitioning the prince of Wales for sympathy, on the ground that the introduction of shoe-strings had nearly ruined their trade. The prince promised to assist them as far as he could, by wearing B. himself, and enjoining his household to do the same; but fashion was too strong even for him, and B. became almost extinct. The opportunity, however, as is remarked by a writer in *Notes and Queries* for 1854, "which buckles afford of ornament and expense has preserved them as a part of the court-dress; and of late years they have appeared a little in private society. They are generally, though not always, worn when a prince of the royal family is of the party; and at the king's private parties, although the rest of the dress be that usually worn, buckles are almost indispensable." Large shoe-buckles, of silver or other metal, are still worn by the clergy of several continental countries, as part of their ordinary costume.

BUCKLEY, James Monroe, D.D See page 882.

BUCKMINSTER, Joseph, D.D., 1751–1812; an American Congregational clergyman, b. Mass. He graduated at Yale, studied theology, and was for a time tutor in the college. In 1779, he became pastor of the North church, Portsmouth, N. H., where he remained for a third of a century, retiring only by reason of failing health. He died soon afterwards, while on a visit to Vermont. Dr. B. took deep interest in the controversy that in his later years divided the Congregationalists into liberals and conservatives. He published many sermons, a memoir of Dr. Mackintosh, and was one of the compilers of the *Piscataqua River Prayer Book*. His daughter published his memoirs and those of his son.

BUCKMINSTER, Joseph Stevens, son of Rev. Joseph, 1784–1812. He was educated at Harvard, and was a teacher in Phillips Exeter academy, having Daniel Webster for one of his pupils. In 1804, he was made pastor of Brattle street church, Boston, one of the leading congregations in New England. In 1806–7, he traveled in Europe, taking a deep interest in the purchase of books for the Boston Athenæum. In 1808, he supervised the republication of *Griesbach's New Testament* (in Greek), and was soon afterwards appointed lecturer on biblical criticism at Cambridge. He was a member of most of the important literary societies of the day. His works have been published in

two volumes. While preparing for his biblical lectures in 1811, he had an attack of epilepsy which broke his intellect, and from its effects he died in the following year.

BUCKNER, Aylett Hawes. See page 882.

BUCKNER, Simon Bolivar, b. Ky., 1823; a graduate of West Point who went into the service of the confederacy, issuing an address to the people of Kentucky to take arms against the usurper Abraham Lincoln. He surrendered Fort Donelson and 16,000 troops to gen. Grant; was for a time a prisoner of war, and was finally in Kirby Smith's surrender to gen. Canby.

BUCKS, a co. in e. Pennsylvania, on the New Jersey border, bounded by Delaware river; 600 sq.m.; pop. '70, 64,336; '80, 68,654. It possesses mines and quarries of iron, plumbago, zircon, limestone, and sandstone. Surface hilly but well cultivated. The North Pennsylvania, Philadelphia and Trenton, and Doylestown railroads pass through. Productions, corn, oats, hay, potatoes, butter, tobacco, etc. Co. seat, Doylestown.

BUCKS. See Buckinghamshire, *ante*.

BUCKSKIN is a fanciful name for a heavy-made, strong-twilled woolen fabric, for trouserings—highly milled to about the usual width for such goods—27 in.; and cropped and finished, with the pile or nap so shorn as to show the texture through it.

BUCKSPORT, a t. in Hancock co., Me., on the Penobscot, 16 m. s. of Bangor; pop. '70, 3433; '80, 3056. It is a handsome town, regularly laid out on a gentle slope. At the bend of the river there is a strong fort commanding the narrows and the river both up and down, As the river seldom freezes here, B. is a convenient winter port for vessels bound to Bangor. There are several ship-yards and manufactories. In the last war with England, B. was captured by the British.

BUCKSTONE, John Baldwin, a distinguished comedian and dramatic writer, was b. in the suburbs of London, in 1802. Preferring the excitement of the stage to the monotony of an attorney's office, he sought and soon found an opportunity in a provincial town for the display of his theatrical abilities. After a probation in the country, he appeared at the Surrey theater in 1823, and his success was so unequivocal, that he was soon engaged by the "management" of the Adelphi theater, where he continued for many years as leading low comedian. He afterwards played at the Haymarket and Drury Lane theaters, of the former of which he was lessee from 1853 to 1878. He died 31st Oct., 1879. B.'s acting was not more noted for its comicality and humor, which never degenerates into vulgarity, than for its distinct appreciation of the peculiar traits in each individual character he assumed. In all his delineations there was the same broad general effect, but the details of each were wrought out with great care and minuteness. B. was also a prolific dramatic author, and of the 150 pieces he is said to have written for the stage, several have been highly popular. Among the best known are *The Green Bushes; The Flowers of the Forest; Luke the Laborer; The Wreck Ashore; The Rough Diamond; Good for Nothing; the Irish Lion;* and *The Alarming Sacrifice.*

BUCKTHORN, *Rhamnus*, a genus of shrubs or small trees of the natural order *rhamnaceæ* (q.v.), distinguished by a bell-shaped 4 to 5-cleft calyx, which divides around the middle after flowering, the upper part falling away, and the base remaining and adhering to the fruit; which is globose, and sometimes succulent, sometimes rather dry or spongy, with 2 to 4 stones. The petals are sometimes wanting. Some of the species are diœcious, some hermaphrodite. They are numerous, and natives of most of the tropical and temperate regions of the world.—The Common Buckthorn (*R. catharticus*) is a deciduous shrub or low tree, frequent in England and in other parts of Europe and the n. of Asia. The leaves are ovate, crenate, and bright green; the branches spiny; the flowers small, yellowish-green, and densely clustered; male and female flowers on separate plants; the berries about the size of peas, globular, bluish-black, nauseous, and violently purgative. They were formerly much used in medicine, but now more rarely, and only in the form of a syrup prepared from their juice. They supply the *sap green* (q.v.) or bladder green of painters. The bark affords a beautiful yellow dye. The B. is sometimes planted for hedges, but is of too straggling a habit.—The Alder Buckthorn, or Berry-bearing Alder (*R. frangula*), is also a native of Britain, and is frequent in woods and thickets throughout Europe. It is a shrub, rarely a small tree, with spineless branches, oval entire leaves, and small, whitish, axillary flowers, which are in general somewhat clustered. The bark of the twigs is gray, and has a very disgusting smell and a nauseous bitter taste. It was formerly used in medicine, along with that of the last species, and has recently been recommended in many quarters as a remedy for intermittent fevers. It contains principally an acrid bitter extractive, a volatile oil containing hydrocyanic acid, and a yellow coloring matter called *rhamnin*. The berries are small and black, and violently purgative. It is objected to their use in medicine that much sickness and thirst attend it. The charcoal of the wood is light, and is used for the preparation of gunpowder. The bark, leaves, and berries are used for dyeing; the bark for dyeing yellow, and with preparations of iron, black; the unripe berries to dye wool green and yellow; the ripe berries to dye it bluish-gray, blue, and green. The flowers are peculiarly grateful to bees.—Dyer's Buckthorn (*R. infectorious*), is a low shrub, abundant in the s. of Europe, whose unripe fruit yields a brilliant yellow dye. The berries and inner bark of *R. tinctorius*, a native of Hungary, are also used in dyeing; and the berries of *R. saxatilis*, a procumbent shrub, growing amongst rocks as far

n. as Switzerland. The *French berries*, *Avignon berries*, or *yellow berries* of dyers, are the fruit of *R. infectorius*, *R. saxatilis*, *R. amygdalina* (or *oleoides*), and *R. Clusii*.—The SEA BUCKTHORN is a shrub of a different genus and order. See SALLOW-THORN.

BUCKU, a name common to several small shrubs of the genus *barosma* (formerly included in *diosma*), natives of the cape of Good Hope, the leaves of which ure used in medicine—sometimes in the form of a powder, more generally of an infusion or a tincture—particularly on account of their powerful operation on the urinary organs, as in chronic inflammation of the bladder, urinary calculus, etc. They are also used in dyspepsia, rheumatism, and dropsy; and are stimulant and antispasmodic, diuretic, diaphoretic, and tonic. They generally appear in commerce mixed with stalks and fruit. They are smooth, leathery, and shining, more or less crenated, or serrated, and are much covered with pellucid dots, which are glands filled with a strongly smelling yellowish volatile oil. The strong odor of B. leaves is generally regarded as disagreeable, but the Hottentots perfume themselves with them. They have a warm taste, resembling that of mint.—The genus *barosma* belongs to the natural order *rutaceæ*, and is distinguished by regular flowers with 5 petals, 5 fertile and 5 abortive scale-like stamens, anthers bearing a minute terminal gland, and a 5-lobed ovary. The species principally yielding the B. leaves of the shops are *B. serratifolia*, *B. crenata*, *B. crenulata*, and *B. venusta*.

BUCKWHEAT, *fagopyrum*, a genus of plants of the natural order *polygoneæ* (q.v.), or, according to many botanists, a subgenus of *polpgonum*, distinguished by the central embryo, and by racemes of flowers grouped in panicles. COMMON B. (*fagopyrum esculentum*, or *polygonum fagopyrum*) is a native of the basin of the Volga, the shores of the Caspian sea, and many parts of central Asia, from which it is said to have been introduced by the Moors into Spain, and thence to have extended over Europe, in many parts of which, and in some places in Britain, it is now naturalized. Another account represents it as having been brought to Europe by the crusaders. In France, it is called *blé Sarrasin*, or Saracen wheat. It is cultivated on account of the farinaceous albumen of its seeds, which are used, as grain, for food of man and cattle. It is upright, branched, 1 to 3 ft. in height; the leaves are between heart-shaped and arrow-shaped, the flowers pale red, the seed (nut) black and triangular, the angles even (not toothed). The resemblance of this seed in form to the beech-nut is supposed to be the reason of the German name *buchwezen* (beech-wheat), from which the English name is derived. B. is a very common crop in some parts of Europe, and of the United States of North America; but is seldom sown in Britain, except as food for pheasants. It requires continued dry weather in autumn for profitable harvesting, and this in the climate of Britain cannot well be reckoned on. In Germany, B. is much valued as a crop, particularly for moorlands and other poor soils. In Bretagne, also, it is as extensively cultivated as wheat. It yields very abundantly, and requires little attention and little manure. Forty bushels or more per acre may be expected, weighing 46 or 48 lbs. per bushel; and notwithstanding the resemblance of the seed to grain in its qualities and uses, wheat, or any other cereal crop, generally succeeds well after B., if care has been taken to keep the land clear by tilling. The seed is most frequently used in the shape of groats, or made into pottage, and in the United States thin cakes are very often made of it. It is very nutritious, containing about 10 per cent of gluten and 52 per cent of starch, besides about 6 per cent of gum and sugar. It is said to be as good as barley for fattening cattle, and better for horses than oats. But as the seed is covered with a very hard rind or thin shell, it must always be shelled before being given to cattle. Poultry are very fond of it. Beer is sometimes brewed from it, and it yields a spirituous liquor of good quality; indeed, it is frequently used in gin-distilleries. As green fodder, the herbage of the plant is said to be more nutritious than clover; but it acts as a narcotic on sheep. Bees delight in its flowers, and in some parts of the United States it is sown on this account. In America the seed is usually sown broadcast over the land which has been plowed in autumn or early spring and well scarified or harrowed. About a bushel and a half of seed is required when sown broadcast, but a bushel is sufficient if drilled with a machine. In the latter case it should not be sown in narrower drills than one foot apart, but 2 ft. is recommended as being better for the succeeding crop, as the wider intervals can be properly cultivated. It should not be sown in England before the middle of May, as the least frost is injurious. When the lower seeds are ripe it should be mown, as they are easily shed out if allowed to stand too long. When bread made from B. forms the principal food of the people, it is thought to have an injurious action on the brain. As a supplementary article, however, it is a favorite among all classes where it is raised.—TARTARIAN B. (*F.* or *P. Tataricum*) is distinguished by the toothed edges of the seeds and its more vigorous growth. It is hardy, and adapted for cold situations. It is a native of Siberia. It is very productive, but the seed falls out when ripe more readily than that of the common species; and the flour is darker colored, and somewhat bitter.—NOTCH-SEEDED B. (*F.* or *P. emarginatum*) is said to be a native of China. Its seeds are larger than those of common B., and their angles are winged. When grown in Britain, many of its flowers are generally abortive.—PERENNIAL B. (*F.* or *P. cymosum*) is a native of Nepaul, very vigorous in its growth, but producing, at least in Britain, comparatively little seed.—The triangular black seed of climbing B. or blackbine (*F.* or *P. convolvulus*), familiar to every one who has eaten oatmeal cakes or porridge, greatly resembles B., but

is smaller. The plant—a very common weed in gardens and cornfields in Britain—also exhibits much similarity, notwithstanding its different habit and twining stem.—DYER'S B. is *Polygonum tinctorium*. See POLYGONEÆ.

BUCKWHEAT TREE, *Cliftonia ligustrina*, an evergreen shrub in the gulf states of the order cyrillaceæ, bearing fragrant white blossoms. It grows around ponds and streams, and gets its name from the shape of its pendulous fruit. Its local name is "titi."

BUCOL'IC, a term derived from the Greek, meaning "belonging to herdsmen," and equivalent to the Latin term *pastoral*. See PASTORAL POETRY.

BUCYRUS, the co. seat of Crawford co., Ohio, on the Sandusky river, 62 m. n. of Columbus; on the Pittsburgh, Fort Wayne, and Chicago railroad; pop. '70, 3066; in '80, 3848. There are mineral springs and a spring of inflammable oil in the neighborhood. It is in a thickly populated district, and is noted for manufactories and schools.

BUC'ZACZ, a t. of the Austrian empire, in Galicia, 30 m. e.n.e. of Stanislawow, on the Stripa, a considerable affluent of the Dniester. A treaty of peace between the Poles and the Turks was signed here in 1672. Pop. 8500.

BUD, *Gemma*, in botany, that part of a plant which contains the rudiments of leaves or flowers prior to their development. Buds are distinguished into *leaf-buds* and *flower-buds*, the former producing leaves, and having a power of extension into a branch; the latter producing flowers only, and ordinarily destitute of this power of extension. The different parts of the flower being regarded, however, as *leaf-organs* or altered leaves (see FLOWER), the flower-bud may be regarded as merely a modified leaf-bud; and it is well known that, by treatment which checks the luxuriant growth of a plant, it may be caused to produce flower-buds where only leaf-buds could otherwise have been expected to appear—a physiological fact, of which advantage is taken in various ways by gardeners, as by removing portions of the bark and even of the woody part of the stem, root-pruning, confining the roots in a flower-pot, etc. Buds usually appear in the axils of leaves, the terminal bud of a branch being no exception to this rule; and there is no leaf without one or more buds in its axil, although many never pass beyond the most rudimentary state. See BRANCH. In cold and temperate climates, buds are formed about midsummer, beginning to appear as soon as the young branch which bears them has itself been properly developed, and are generally covered with scales and often also coated with resinous matter, by which their tender contents are protected from the severity of winter; but in the trees of warm climates, the protection of scales is generally wanting. Within the leaf-bud, the future leaves may be discovered, often very curiously folded or rolled up, and the different forms and positions which the leaves assume in the bud, are very characteristic of different kinds of plants. This is called the *vernation* (q.v.) of leaves, and is analogous to the *æstivation* (q.v.) of flowers. The buds of exogenous plants originate in cellular prolongations of the medullary rays bursting through the bark; those of endogenous plants are in communication with the cellular matter which lies between the bundles of woody tissue in the stem; and buds elongate into branches by the addition of new cellular matter to the extremity. Leaf-buds are capable of subsisting when separated from the parent plant and placed in favorable situations, developing themselves into new plants with the most exact correspondence in their characteristics to the parent plant; and of this gardeners avail themselves in the process of *budding* (q.v.), and in various ways for the propagation of plants. Some plants propagate themselves by a natural detachment of buds (*bulbils* or *bulblets*), modified into a character analogous to that of *bulbs* (q.v.); and bulbs themselves may indeed be regarded as subterranean leaf-buds with thickened scales. The *eyes* of the potato are also subterranean leaf-buds, the tuber being regarded as a thickened subterranean stem; and all plants with subterranean stems produce subterranean leaf-buds, sending above ground only herbaceous annual shoots, as asparagus, the banana, etc. Buds may be produced in exogenous plants from the extremity of any medullary ray, and may be made to spring from a leafless part of the stem by an incision, the effect of which is to direct a greater supply of sap to the part immediately beneath it. In a few plants, buds are produced on the edges, or even on the surface of leaves. In consequence of their power of independent existence, buds have been looked upon by some physiologists as distinct organized beings congregated in the tree or plant, a view which involves exaggeration, and therefore error.—Flower-buds cannot be used for budding, or otherwise for propagation of the plant, but when removed from their original stock, always die.

Some of the lowest animals propagate themselves by buds (*gemmation*), and many of the zoophyte systems or polypidoms extend in this manner. See GEMMATION, REPRODUCTION, POLYPI, and ZOOPHYTES.

BU'DA (Slavonic, *Bu'din;* German, *O'fen*), a city of Hungary, forming with Pesth (with which it is united by a magnificent suspension-bridge) the capital of the country, is situated on the right bank of the Danube about 130 m. s.e. of Vienna, in lat. 47° 29′ n., and long. 19° 3′ east. B. has a highly picturesque appearance, being built round the Schlossberg (Castle-hill) in the form of an amphitheater, in the midst of a district covered with vineyards. Crowning this center hill or rock, which has an elevation of 485 ft. above the sea, is the citadel; the palace in which are preserved the royal insignia of

Hungary; and an old Gothic church. Behind, and towering above the rock, rises the Blocksberg, strongly fortified, with a precipitous face to the Danube, the slopes of the other sides being occupied with houses. B. has many educational and charitable institutions; and a fine observatory crowns the Blocksberg. It has some celebrated hot sulphur springs, with a temperature of 117° 5′ F., from which it derives its German name, Ofen (Oven). Three of the baths erected by the Turks are still in a perfect state of preservation, and are much frequented by the common people. B. has some manufactures of silk, velvet, woolens, cotton, leather, and gunpowder, and cannon and type foundries; but its chief trade is in wine, of which it produces between four and five millions of gallons annually. This is known as the "Ofenerwein," and is of excellent quality. Pop. '69, 53,998. B. is a place of great antiquity, but its importance dates from 1240, when the fortress was erected on the Schlossberg. During the inroads of the Turks, it was regarded as the key of Christendom. It was captured by Solyman the magnificent in 1526, but retaken in the following year by Ferdinand I., king of Bohemia. In 1541, it was again taken by Solyman, who introduced into it a garrison of 12,000 janizaries; and it remained in possession of the Turks until 1686, when it was captured by the duke of Lorraine. B. and Pesth (q.v.) were in 1872 incorporated with one another, the official name being the compound *Budapest*, pop. '80, 359,821.

BUDÆUS (the Latinized form of *Guillaume Bude*), one of the greatest French scholars of his age, was b. in Paris in 1467. He studied there and at Orleans. His works on philology, philosophy, and jurisprudence display extensive learning, but the two best known are the *De Asse et Partibus ejus* (Paris, 1514), which contains a very thorough investigation into ancient coins; and the *Commentarii Linguæ Græcæ* (Paris, 1519), which greatly advanced the study of Greek literature in France, and is still held in high estimation by classical scholars. B.'s knowledge of Greek was particularly good. His style both in Latin and French is nervous, but harsh, and abounds in Greek constructions. His abilities were manifested not only in literature, but in public business. Louis XII. twice sent him to Rome as ambassador; and Francis I. also employed him in several negotiations. At B.'s suggestion, Francis founded the *Collége de France*, and was also persuaded to refrain from prohibiting printing, which the bigoted Sorbonne had advised in 1533. During his life, B. held several important offices. He was royal librarian, maître des requêtes, and provost of Paris. He died 23d Aug., 1540. A collected edition of his works appeared at Basel in 1557. B. was suspected of a leaning towards Calvinism. Certain circumstances render this highly probable. In his correspondence with his friend Erasmus, he repeatedly expresses his contempt for monks and ignorant ecclesiastics, and on one occasion terms the doctors of the Sorbonne "prating sophists." Besides, what is perhaps even more conclusive, shortly after his death, his widow and several members of his family went to Geneva, and openly abjured Catholicism.

BUDAON′, Budaun, or Budayoon, a t. of India, 140 m. n.w. of Lucknow, giving its name to a British district of the Rohilcund division of the lieutenant-governorship of the n.w. provinces. It is situated in 28° 2′ n. lat., and 79° 11′ e. long. Its pop. was officially ascertained in 1872 to amount to 33,322. It was occupied by the mutineers and a body of liberated prisoners from Bareilly, June 1, 1857. The Europeans escaped by flight. It was captured by gen. Whitelock, April 19, 1858, and the rebels in this quarter were soon afterwards entirely subdued.—The district of Budaon contains an area of 2005 sq.m., and a pop. (1872) of 934,348, of which nearly six sevenths are Hindus, and the remainder mostly Mussulmans. The district is a level, fertile tract on the Ganges and tributaries of it, of which the chief is the Ramgunga,

BUDDÆUS, Johann Franz, 1667–1729; a learned Lutheran divine, b. in Pomerania. At Wittenberg he won distinction in languages, theology, and history; was Greek and Latin professor at Coburg, professor of ethical sciences and politics in the university of Halle, and in 1705 professor of divinity at Jena. He produced an historical German dictionary, an ecclesiastical history of the Old Testament, a work on practical philosophy, one on laws, and a universal theological history.

BUD′DHISM—BUD′DHA. The religion known as Buddhism (from the title of "The Buddha," meaning "the wise," "the enlightened," acquired by its founder) has existed now for 2460 years, and may be said to be the prevailing religion of the world. In Hindustan, the land of its birth, it has now little hold, except among the Nepaulese and some other northern tribes; but it bears full sway in Ceylon, and over the whole eastern peninsula; it divides the adherence of the Chinese with the systems of Confucius and Lao-tse, claiming perhaps two thirds of the population; it prevails also in Japan (although not the established religion); and, n. of the Himalayas, it is the religion of Thibet (where it assumes the form of Lamaism), and of the Mongolian population of central Asia, and extends to the very n. of Siberia, and even into Swedish Lapland. Its adherents are estimated at 400 millions—more than a third of the human race. Yet, till near the middle of this century, nothing was known in Europe respecting the nature and origin of this world-religion, beyond the vaguest notices and conjectures. About the year 1828, Mr. B. H. Hodgson, British resident at the court of Nepaul, where Buddhism prevails, discovered the existence of a large set of writings in the Sanscrit language, forming the national canonical books. These books have since been found to be the

texts from which the Buddhist Scriptures of Thibet, Mongolia, and China must have been translated. The books of the Ceylon Buddhists are in the language called Pali; and though not translations of the Nepaulese standards, they are found to agree with them in substance, and to be only another and somewhat later version of the same traditions. Translations from the Ceylon standards are used by the Buddhists of Burmah and Siam. Copies of the Sanscrit books of Nepaul, having been sent by Mr. Hodgson to the Asiatic societies of London and Paris, engaged the attention of the eminent oriental scholar, Eugène Burnouf, who published in 1844 his *Introduction to the History of Buddhism;* and this book may be said to have been the beginning of anything like correct information on the subject among the western nations.

The most diverse opinions had previously prevailed as to the time and place of the origin of Buddhism. Some looked upon it as a relic of what had been the original religion of Hindustan, before Brahmanism intruded and drove it out; a relic of a widespread primeval worship, whose ramifications it was endeavored to trace by identifying Buddha with the Woden of the Scandinavians, the Thoth or Hermes of the ancient Egyptians, and other mythological personages. Others held that it could not be older than Christianity, and must have originated in a blundering attempt to copy that religion—so striking are the many points of resemblance that present themselves. Although the means are still wanting of giving a circumstantial history of Buddhism, the main outline is no longer doubtful. Oriental scholars now concur in fixing the date of its origin about the beginning of the 6th c. B.C., and in making it spring up in the n. of Hindustan. According to the Buddhist books, the founder of the religion was a prince of the name of Siddhartha, son of Suddhodana, king of Kapilavastu, which is placed somewhere on the confines of Oude and Nepaul. He is often called Sakya, which was the name of the family, and also Gautama, the name of the great "Solar" race of which the family was a branch. The name Sakya often becomes Sakya-muni (*muni*, in San., means "solitary," and is allied to Gr. *monos*, the root of "monk"), in allusion to the solitary habits assumed by the prince. To Gautama is frequently prefixed *Sramana*, meaning *ascetic*. Of the names, or rather titles, given to Siddhartha in his state of perfection, the most important is the *Buddha*,* which is from the root *budh*, to know, and, according to Wilson, means properly, "he to whom truth is known:" it is indicative of the leading doctrine of his system. Others are "The blessed" (Bhagavat); "the venerable of the world;" "the Bodhisatva," the import of which will be afterwards explained. The history of this person is overlaid with a mass of extravagant and incredible legend; and at least one eminent orientalist, prof. H. H. Wilson, thinks it still doubtful whether the Buddha was an actual historical personage, and not rather an allegorical figment. Agreeing that the doctrine was introduced about the time assigned, he thinks it more likely that it originated with a school formed of persons of various castes, comprising even Brahmans. But by oriental authorities generally, the Buddha is received as the actual personal founder of the religion that goes by his name.

Assuming that the Buddha was a real person, and that there is a basis of fact under the mass of extravagant fable with which he is surrounded, the history of Buddhism may be thus briefly outlined: The prince Siddhartha gives early indications of a contemplative, ascetic disposition; and his father, fearing lest he should desert his high station as Kshatriya (see HINDUISM and CASTE) and ruler, and take to a religious life, has him early married to a charming princess, and surrounded with all the splendor and dissipation of a luxurious court. Twelve years spent in this environment only deepen the conviction, that all that life can offer is vanity and vexation of spirit. He is constantly brooding over the thought that old age, withered and joyless, is fast approaching; that loathsome or racking sickness may at any moment seize him; that death will at all events soon cut off all present sources of enjoyment, and usher in a new cycle of unknown trials and sufferings. These images hang like Damocles' sword over every proposed feast of pleasure, and make enjoyment impossible. He therefore resolves to try whether a life of austerity will not lead to peace; and, although his father seeks to detain him by setting guards on every outlet of the palace, he escapes, and begins the life of a religious mendicant, being now about 30 years old. To mark his breaking off all secular ties, he cuts off the long locks that were a sign of his high caste; and as the shortened hair turned upwards, he is always represented in figures with curly hair, which induced early European writers to consider him as of Ethiopian origin. He commences by studying all that the Brahmans can teach him, but finds their doctrine unsatisfactory. Six years of rigorous asceticism are equally vain; and resolving to return to a more genial life, he is deserted by his five disciples, and then undergoes a fierce temptation from the demon of wickedness. But no discouragement or opposition can divert Sakya-muni from the search after deliverance. He will conquer the secret by sheer force of thinking. He sits for weeks plunged in abstraction, revolving the causes

* There is a confusing variety in the modes in which this name is spelled by European writers. S. Hardy, in his *Manual of Buddhism*, gives more than fifty forms that have come under his notice. Some of the more common are Bud, Bod, Buth, Budh, Boodh, Bhood, Budo, Buddow, Boutta, Poota, Poth, Pot. The Chinese, owing to the meagerness of their articulations, seem to have been unable to come nearer to the real sound than Fo, Foe, or Fohi; from the same cause, they convert Brahma into Fan.

of things. If we were not born, he reflects, we should not be subject to old age, misery, and death; therefore, the cause of these evils is birth. But whence comes birth or continued existence? Through a long concatenation of intermediate causes, he arrives at the conclusion that ignorance is the ultimate cause of existence; and therefore, with the removal of ignorance, existence and all its anxieties and miseries would be cut off at their source. Passing through successive stages of contemplation, he realizes this in his own person, and attains the perfect wisdom of the Buddha. The scene of this final triumph received the name of Bodhimanda (the seat of intelligence), and the tree under which he sat was called Bodhidruma (the tree of intelligence), whence bo-tree. The Buddhists believe the spot to be the center of the earth. Twelve hundred years after the Buddha's death, Hiouen-Thsang, the Chinese pilgrim, found the Bodhidruma—or a tree that passed for it—still standing. Although the religion of Buddha is extinct in the neighborhood, there are, about 5 m. from Gaya Proper, in Bahar, extensive ruins and an old dagoba, or a temple, which are believed to mark the place. Near the temple there flourished, in 1812, a peepul-tree, apparently 100 years old, which may have been planted in the place of the original bo-tree.

Having arrived at the knowledge of the causes of misery, and of the means by which these causes are to be counteracted, the Buddha was now ready to lead others on the road to salvation. It was at Benares that he first preached, or, in the consecrated phrase, "turned the wheel of the law;"* but the most important of his early converts was Bimbisara, the sovereign of Magadha (Bahar), whose dynasty continued for many centuries to patronize the new faith. During the forty years that he continued to preach his strange gospel, he appears to have traversed a great part of northern India, combating the Brahmans, and everywhere making numerous converts. He died at Kusinagara (in Oude), at the age of 80, in the year 543 B.C.; and his body being burned, the relics were distributed among a number of contending claimants, and monumental tumuli were erected to preserve them. See TOPES.

The most important point in the history of Buddhism, after the death of its founder, is that of the three councils which fixed the canon of the sacred scriptures and the discipline of the church. The Buddha had written nothing himself; but his chief followers, assembled in council immediately after his death, proceeded to reduce his teaching to writing. These canonical writings are divided into three classes, forming the tripitaka or "triple basket." The first class consist of the *soutras*, or discourses of the Buddha; the second contains the *vinaya*, or discipline; and the third the *abhidharma*, or metaphysic. The first is evidently the fundamental text out of which all the subsequent writings have been elaborated. The other two councils probably revised and expanded the writings agreed upon at the first, adding voluminous commentaries; as to the dates of the other two councils, there are irreconcilable discrepancies in the accounts; but at all events the third was not later than 240 B.C., so that the Buddhist canonical scriptures, as they now exist, were fixed two centuries and a half before the Christian era. The Buddhist religion early manifested a zealous missionary spirit; and princes and even princesses became devoted propagandists. A prince of the royal house of Magadha, Mahindo, carried the faith to Ceylon, 307 B.C. The Chinese annals speak of a Buddhist missionary as early as 217 B.C.; and the doctrine made such progress, that in 65 A.D. it was acknowledged by the Chinese emperor as a third state religion. The Chinese Buddhists have always looked on India as their "holy land;" and, beginning with the 4th c. of our era, a stream of Buddhist pilgrims continued to flow from China to India during six centuries. Several of these pilgrims have left accounts of their travels, which throw a light on the course of Buddhism in India, and on the internal state of the country in general, that is looked for in vain in the literature of India itself. See HIOUEN-THSANG. As to the spread of Buddhism n. of the Himalayan mountains, we have the historical fact, that a Chinese general, having about the year 120 B.C. defeated the barbarous tribes to the n. of the desert of Gobi, brought back as a trophy a golden statue of the Buddha.

A prominent name in the history of Buddhism is that of Asoka, king of Magadha, in the 3d c. of our era, whose sway seems to have extended over the whole peninsula of Hindustan, and even over Ceylon. This prince was to Buddhism what Constantine was to Christianity. He was at first a persecutor of the faith, but being converted—by a miracle, according to the legend—he became its zealous propagator. Not, however, as princes usually promote their creed; for it is a distinguishing characteristic of Buddhism, that it has never employed force, hardly even to resist aggression. Asoka showed his zeal by building and endowing viharas or monasteries, and raising topes and other monuments over the relics of Buddha and in spots remarkable as the scenes of his labors. Hiouen-Thsang, in the 7th c. of our era, found topes attributed to Asoka from the foot of the Hindu Kush to the extremity of the peninsula. There exist, also, in different parts of India, edicts inscribed on rocks and pillars inculcating the doctrines of Buddha. The edicts are in the name of king Piyadasi; but orientalists are almost unanimous in hold-

*From a too literal understanding of this phrase have arisen, probably, those praying-wheels, or rather wheels for meditation, seen standing before Buddhist monasteries in Thibet and elsewhere. The doctrines of Buddha are inscribed on the wheel, which is then set in motion by a windlass, or even by horse-power. The individual monks have portable ones, with which they perform their devotions wherever they may happen to be.

ing Piyadasi and Asoka to be one and the same. Not a single building or sculptured stone has been discovered in continental India of earlier date than the reign of this monarch, whose death is assigned to 226 B.C. A remarkable spirit of charity and toleration runs through these royal sermons. The "king beloved of the gods" desires to see the ascetics of all creeds living in all places, for they all teach the essential rules of conduct. "A man ought to honor his own faith only; but he should never abuse the faith of others. . . . There are even circumstances where the religion of others ought to be honored, and in acting thus, a man fortifies his own faith, and assists the faith of others."

For the glimpses we get of the state of Buddhism in India, we are indebted chiefly to the accounts of Chinese pilgrims. Fa-hian, at the end of the 4th c., found some appearances of decline in the e. of Hindustan, its birthplace, but it was still strong in the Punjab and the north. In Ceylon, it was flourishing in full vigor, the ascetics or monks numbering from 50,000 to 60,000. In the 7th c.—that is, 1200 years after the death of the Buddha—Hiouen-Thsang represents it as widely dominant and flourishing, and patronized by powerful rajahs. Its history was doubtless more or less checkered. The Brahmans, though little less tolerant than the followers of Buddha, seem to have been in some cases roused into active opposition; and some princes employed persecution to put down the new faith.

It was probably during the first four or five centuries of our era, and as a result of persecution, that Buddhists, driven from the great cities, retired among the hills of the west, and there constructed those cave-temples which, for their number, vastness, and elaborate structure, continue to excite the wonder of all who see them. There are reckoned to be not fewer thon 900 Buddhist excavations still extant in India, nearly all within the presidency of Bombay. How the destruction of the Buddhist faith in Hindustan came about—whether from internal corruption, or the persecution of powerful princes, adherents of the old faith—we are utterly in the dark. But it is certain that from the time of Hiouen-Thsang's visit, its decay must have been rapid beyond precedent; for about the 11th or 12th c., the last traces of it disappear from the Indian peninsula.

What, then, is the nature of this faith, which has been for so long, and is still, the sole light of so many millions of human beings? In answering this question, we must confine ourselves here to a brief outline of the intellectual theory on which the system is based, and of the general character of its morality and ritual observances, as they were conceived by the founder and his more immediate followers; referring for the various forms which the external observances have assumed to the several countries where it is believed and practiced. See BURMAH, CEYLON, CHINA, JAPAN, LAMAISM.

Buddhism is based on the same views of human existence, and the same philosophy of things in general, that prevailed among the Brahmans. It accepts without questioning, and in its most exaggerated form, the doctrine of the transmigration of souls, which lies at the root of so much that is strange in the eastern character. For a particular account of this important doctrine or notion, which seems ingrained in the constitution of eastern minds, and without a knowledge of which no phase of thought or feeling among them can be understood, the reader is referred to TRANSMIGRATION; while the peculiar cosmogony or system of the universe with which it is associated, and which is substantially the same among Hindus and Buddhists, will be described under HINDUISM. It is sufficient here to say, that, according to Buddhist belief, when a man dies, he is immediately born again, or appears in a new shape; and that shape may, according to his merit or demerit, be any of the innumerable orders of being composing the Buddhist universe—from a clod to a divinity. If his demerit would not be sufficiently punished by a degraded earthly existence—in the form, for instance, of a woman or a slave, of a persecuted or a disgusting animal, of a plant, or even of a piece of inorganic matter—he will be born in some one of the 136 Buddhist hells, situated in the interior of the earth. These places of punishment have a regular gradation in the intensity of the suffering and in the length of time the sufferers live, the least term of life being 10 millions of years, the longer terms being almost beyond the powers of even Indian notation to express. A meritorious life, on the other hand, secures the next birth either in an exalted and happy position on earth, or as a blessed spirit, or even divinity, in one of the many heavens; in which the least duration of life is about 10 billions of years. But however long the life, whether of misery or of bliss, it has an end, and at its close the individual must be born again, and may again be either happy or miserable—either a god or, it may be, the vilest inanimate object.* The Buddha himself, before his last birth as Sakyamuni, had gone through every conceivable form of existence on the earth, in the air, and in the water, in hell and in heaven, and had filled every condition in human life. When he attained the perfect knowledge of the Buddha, he was able to recall all these existences; and a great part of the Buddhist legendary literature is taken up in narrating his exploits when he lived as an elephant, as a bird, as a stag, and so forth.

The Buddhist conception of the way in which the quality of actions—which is expressed in Pali by the word *karma*, including both merit and demerit—determines

* One legend makes Bhagavat, in order to impress upon the monks of a monastery the importance of their duties, point to a besom, and, by his supernatural insight, reveal to them that it had once been a novice, who had been negligent in sweeping the hall of assembly; the walls and pillars, again, he told them, had once existed as monks, who soiled the walls of the hall by spitting upon them.

the future condition of all sentient beings, is peculiar. They do not conceive any god or gods as being pleased or displeased by the actions, and as assigning the actors their future condition by way of punishment or of reward. The very idea of a god, as creating or in any way ruling the world, is utterly absent in the Buddhist system. God is not so much as denied; he is simply not known. Contrary to the opinion once confidently and generally held, that a nation of atheists never existed, it is no longer to be disputed that the numerous Buddhist nations are essentially atheist; for they know no beings with greater supernatural power than any man is supposed capable of attaining to by virtue, austerity, and science; and a remarkable indication of this startling fact is to be seen in the circumstance that some at least of the Buddhist nations—the Chinese, Mongols,and Thibetans—have no word in their languages to express the notion of God. The future condition of the Buddhist, then, is not assigned him by the Ruler of the universe; the "karma" of his actions determines it by a sort of virtue inherent in the nature of things—by the blind and unconscious concatenation of cause and effect. But the laws by which consequences are regulated seem dark, and even capricious. A bad action may lie dormant, as it were, for many existences; the taint, however, is there, and will some time or other break out. A Buddhist is thus never at a loss to account for any calamity that may befall himself or others.

Another basis of Buddhism is the assumption that human existence is on the whole miserable, and a curse rather than a blessing. This notion, or rather feeling, is, like transmigration, common to Buddhism and Brahmanism, and is even more prominent in Buddhism than in the old faith. It is difficult for a European to conceive this state of mind, or to believe that it can be habitual in a whole people; and many signal errors in dealing with the Indian nations have arisen from overlooking the fact. The cause would seem to lie chiefly in the comparatively feeble physical organization of easterns in general. With a vigorous animal vitality, there is a massive enjoyment in mere bodily existence sufficient to drown a large amount of irritation and suffering, leaving life still sweet and desirable; while the spontaneous activity attending this vigor, makes it a pleasure instead of a pain to contend with and conquer difficulties. The Indian, on the contrary, even when he looks robust, has little intensity of animal vitality; and therefore, bodily existence, in itself, has to him little relish. Tedium of life, it is well known, arises more from negative than positive sources; and it requires but little bitter added to make his cup disgusting. So far, again, from finding activity a source of enjoyment, exertion is painful, and entire quiescence is, in his eyes, the highest state of conceivable enjoyment. When to this we add that want of security and peace, and that habitual oppression of the many by the few, with all the attendant degradation and positive suffering, which may be considered the normal state of things in the east, need we wonder that to men so constituted and so circumstanced, life should seem a burden, a thing rather to be feared than otherwise? The little value that Hindus set upon their lives is manifested in many ways. The punishment of death, again, has little or no terror for them, and is even sometimes coveted as an honor. For, in addition to the little value of their present existence, they have the most undoubting assurance that their soul, if dislodged from its present tenement, will forthwith find another, with a chance, at least, of its being a better one

In the eyes, then, of Sakya-muni and his followers, sentient existence was hopelessly miserable. Misery was not a mere taint in it, the removal of which would make it happy; misery was its very essence. Death was no escape from this inevitable lot; for, according to the doctrine of transmigration, death was only a passage into some other form of existence equally doomed. Even the heaven and the state of godhead which form part of the cycle of changes in this system, were not final; and this thought poisoned what happiness they might be capable of yielding. Brahman philosophers had sought escape from this endless cycle of unsatisfying changes, by making the individual soul be absorbed in the universal spirit (Brahm); Gautama had the same object in view —viz., exemption from being born again; but he had not the same means of reaching it. His philosophy was utterly atheistic, like that of the original Sankhya school of philosopy, whose views he chiefly borrowed, and ignored a supreme God or Creator; it did not leave even an impersonal spirit of the universe into which the human soul could be absorbed. Gautama sees no escape but in what he calls NIRVANA, the exact nature of which has been matter of dispute. According to its etymology, the word means "extinction," "blowing out," as of a candle; and most orientalists are agreed that in the Buddhist scriptures generally it is equivalent to annihilation Even in those schools which attempt to draw a distinction, the distinction is of the most evanescent kind. See NIRVANA.

The key of the whole scheme of Buddhist salvation lies in what Gautama called his four sublime verities. The first asserts that pain exists; the second, that the cause of pain is desire or attachment—the meaning of which will appear further on; the third, that pain can be ended by Nirvana; and the fourth shows the way that leads to Nirvana This way to Nirvana consists in eight things: right faith, right judgment, right language right purpose, right practice, right obedience, right memory, and right meditation. In order to understand how this method is to lead to the proposed end, we must turn to the metaphysical part of the system contained in the "concatenation of causes," which may be looked upon as a development of the second "verity"—namely, that the cause of

pain is desire—or rather, as the analysis upon which that verity is founded. The immediate cause of pain is birth, for if we were not born, we should not be exposed to death or any of the ills of life. Birth, again, is caused by previous existence; it is only a transition from one state of existence into another. All the actions and affections of a being throughout his migrations leave their impressions, stains, attachments adhering to him, and the accumulation of these determines at each stage the peculiar modification of existence he must next assume. But for these adhesions, the soul would be free; not being bound down to migrate into any determinate condition of life, it would follow that it need not migrate at all. These adhesions or attachments, good and bad, depend upon desire, or rather, upon affection of any kind in the soul towards the objects; as if only what moved the soul to desire or avoidance could leave its impress upon it. We thus arrive at desire—including both the desire to possess, and the desire to avoid—as one link in the chain of causes of continued existence and pain. Beyond this the dependence of the links is very difficult to trace; for desire is said to be caused by perception, perception by contact, and so on, until we come to ideas. Ideas, however, are mere illusions, the results of ignorance or error, attributing durability and reality to that which is transitory and imaginary. Cut off this ignorance, bring the mind into a state in which it can see and feel the illusory nature of things, and forthwith the whole train vanishes; illusory ideas, distinction of forms, senses, contact, perception, desire, attachment, existence, birth, misery, old age, death!

Morality and Religious Observances.—The eight parts or particulars constituting the theoretical "way" (to Nirvana), was developed by Gautama into a set of practical precepts enjoining the various duties of common life and of religion. They are all ostensibly intended as means of counteracting or destroying the chain of causes that tie men to existence and necessitate being born again, especially that most important link in the chain constituted by the attachments or desires resulting from former actions; although the special fitness of some of the precepts for that end is far from being apparent. It is easy to understand how the austerities that are prescribed might subdue the passions and affections, and lessen the attachment to existence; but how the exercise of benevolence, of meekness, of regard to truth, of respect to parents, etc., on which Gautama laid so much stress, should have this effect, it is difficult to conceive. Luckily for the Buddhist world, Gautama's moral nature was better than his logic, or rather than the perverse assumptions from which his logic starts; and as he felt strongly—what all men have felt more or less—that these things are essentially right and good, he takes it for granted that they must contribute to what was in his eyes the chief good—escape from existence, or Nirvana. In delivering his precepts, the Buddha considers men as divided into two classes—those who have embraced the religious life (*Sramanas*), and those who continue in the world, or are laymen. These last are considered as too much attached to existence to feel any desire or have any hope of emancipation, at least at this stage. But there are certain precepts which it is necessary for all to obey, that they may not bring greater misery upon themselves in their next births, and rivet the bonds of existence more indissolubly. There are ten moral precepts or "precepts of aversion." Five of these are of universal obligation—viz., not to kill; not to steal; not to commit adultery; not to lie; not to be drunken. Other five are for those entering on the direct pursuit of Nirvana by embracing the religious life: to abstain from food out of season—that is, after midday; to abstain from dances, theatrical representations, songs, and music; to abstain from personal ornaments and perfumes; to abstain from a lofty and luxurious couch; to abstain from taking gold and silver. For the regular ascetics or monks, there are a number of special observances of a very severe kind. They are to dress only in rags, sewed together with their own hands, and to have a yellow cloak thrown over the rags. They are to eat only the simplest food, and to possess nothing except what they get by collecting alms from door to door in their wooden bowl. They are allowed only one meal, and that must be eaten before midday. For a part of the year, they are to live in forests, with no other shelter except the shadow of a tree, and there they must sit on their carpet even during sleep, to lie down being forbidden. They are allowed to enter the nearest village or town to beg food, but they must return to their forests before night.

Besides the absolutely necessary "aversions and observances" above mentioned, the transgression of which must lead to misery in the next existence, there are certain virtues or "perfections" of a supererogatory or transcendent kind, that tend directly to "conduct to the other shore" (Nirvana). The most essential of these are almsgiving or charity, purity, patience, courage, contemplation, and knowledge. Charity or benevolence may be said to be the characteristic virtue of Buddhism—a charity boundless in its self-abnegation, and extending to every sentient being. The benevolent actions done by the Buddha himself, in the course of his many millions of migrations, were favorite themes of his followers. On one occasion, seeing a tigress starved and unable to feed her cubs, he hesitated not to make his body an oblation to charity, and allowed them to devour him. Benevolence to animals, with that tendency to exaggerate a right principle so characteristic of the east, is carried among the Buddhist monks to the length of avoiding the destruction of fleas and the most noxious vermin, which they remove from their persons with all tenderness.

There are other virtues of a secondary kind, though still highly commendable. Thus,

not content with forbidding lying, the Buddha strictly enjoins the avoidance of all offensive and gross language, and of saying or repeating anything that can set others at enmity among themselves; it is a duty, on the contrary, especially for a sramana, to act on all occasions as a peacemaker. Patience under injury, and resignation in misfortune, are strongly inculcated. Humility, again, holds a no less prominent place amongst Buddhist graces than it does among the Christian. The Buddhist saints are to conceal their good works, and display their faults. As the outward expression of this sentiment of humility, Gautama instituted the practice of confession. Twice a month, at the new and at the full moon, the monks confessed their faults aloud before the assembly. This humiliation and repentance seems the only means of expiating sin that was known to Gautama. Confession was exacted of all believers, only not so frequently as of the monks. The edicts of Piyadasi recommend a general and public confession at least once in five years. The practice of public confession would seem to have died out by the time of Hiouen-Thsang's visit to India.

Such are the leading features of the moral code of the Buddha, of which it has been said, that "for pureness, excellence, and wisdom, it is only second to that of the Divine Lawgiver himself." But the original morality of Buddhism has, in the course of time, been disfigured by many subtilties, puerilities, and extravagances, derived from the casuistry of the various schools of later times; just as the casuistry of the Jesuits, for instance, perverted many of the precepts of Christianity. The theory on which the Buddha founds his whole system gives, it must be confessed, only too much scope to such perversions; for, on that theory, truth is to be spoken, self to be sacrificed, benevolence to be exercised, not for the sake of the good thus done to others, but solely for the effect of this conduct on the soul of the actor, in preparing him for escape from existence. To teach men "the means of arriving at the other shore," was another expression for teaching virtue; and that other shore was annihilation. On this principle, the Buddhist casuist can, like the Jewish, render of none effect the universal law of charity and the duty of respecting and aiding parents, on which the Buddha laid such stress. Thus, a Bikshu—that is, one who has engaged to lead a life of self-denial, celibacy, and mendicancy, and is thus on the high-road to Nirvana—is forbidden to look at or converse with a female, lest any disturbing emotion should ruffle the serene indifference of his soul; and so important is this, that "if his mother have fallen into a river, and be drowning, he shall not give her his hand to help her out; if there be a pole at hand, he may reach that to her; but if not, she must drown."—*Wilson.*

Contemplation and science or knowledge (i. e., of the concatenation of causes and effects) are ranked as virtues in Buddhism, and hold a prominent place among the means of attaining Nirvana. It is reserved, in fact, for abstract contemplation to effect the final steps of the deliverance. Thought is the highest faculty of man, and, in the mind of an eastern philosopher, the mightiest of all forces. A king who had become a convert to Buddhism is represented as seating himself with his legs crossed, and his mind collected; and "cleaving, with the thunderbolt of science, the mountain of ignorance," he saw before him the desired state. It is in this cross-legged, contemplative position that the Buddha is almost always represented—that crowning intellectual act of his, when, seated under the Bo-tree (q.v.), he attained the full knowledge of the Buddha, saw the illusory nature of all things, broke the last bonds that tied him to existence, and stood delivered for evermore from the necessity of being born again, being considered the culmination of his character, and the highest object of imitation to all his followers.

"Complete" Nirvana or extinction cannot, of course, take place till death; but this state of preparation for it, called simply Nirvana, seems attainable during life, and was, in fact, attained by Gautama himself. The process by which the state is attained is called *Dhyana*, and is neither more nor less than ecstacy or trance, which plays so important a part among mystics of all religions. The individual is described as losing one feeling after another, until perfect apathy is attained, and he reaches a region "where there are neither ideas, nor the idea of the absence of ideas!"

The *ritual* or *worship* of Buddhism—if worship it can be called—is very simple in its character. There are no priests, or clergy, properly so called. The *Sramanas* or *Bikshus* (mendicants) are simply a religious order—a kind of monks, who, in order to the more speedy attainment of Nirvana, have entered on a course of greater sanctity and austerity than ordinary men; they have no sacraments to administer or rites to perform for the people, for every Buddhist is his own priest. The only thing like a clerical function they discharge, is to read the scriptures or discourses of the Buddha in stated assemblies of the people held for that purpose. They have also everywhere, except in China, a monopoly of education; and thus in Buddhist countries education, whatever may be its quality, is very generally diffused. In some countries, the monks are exceedingly numerous, around Lhassa in Thibet, for instance, they are said to be one third of the population. They live in *viharas* or monasteries, and subsist partly by endowments, but mostly by charity. Except in Tibet, they are not allowed to engage in any secular occupation. The vow is not irrevocable. This incubus of monachism constitutes the great weakness of Buddhism in its social aspect. Further particulars regarding Buddhist monks and monasteries, as well as the forms of Buddhist worship generally, will be given when speaking of the countries where the religion prevails. See LAMAISM.

The adoration of the statues of the Buddha and of his relics is the chief external ceremony of the religion. This, with prayer and the repetition of sacred formulas, constitutes the ritual. The centers of the worship are the temples containing statues, and the topes or tumuli erected over the relics of the Buddha, or of his distinguished apostles, or on spots consecrated as the scenes of the Buddha's acts. The central object in a Buddhist temple, corresponding to the altar in a Roman Catholic church, is an image of the Buddha, or a dagoba or shrine containing his relics. Here flowers,* fruit, and incense are daily offered, and processions are made with singing of hymns. Of the relics of the Buddha, the most famous are the *teeth* that are preserved with intense veneration in various places. Hiouen-Thsang saw more than a dozen of them in different parts of India; and the great monarch Ciladitya was on the eve of making war on the king of Cashmere for the possession of one, which, although by no means the largest, was yet an inch and a half long. The tooth of the Buddha preserved in Ceylon, a piece of ivory about the size of the little-finger, is exhibited very rarely, and then only with permission of the English government—so great is the concourse and so intense the excitement. See CEYLON.

There appears at first sight to be an inconsistency between this seeming worship of the Buddha and the theory by which he is considered as no longer existing. Yet the two things are really not irreconcilable; not more so, at least, than theory and practice often are. With all their admiration of the Buddha, his followers have never made a god of him. Gautama is only the last Buddha—the Buddha of the present cycle. He had predecessors in the cycles that are past (24 Buddhas of the past are enumerated, and Gautama could even tell their names); and when, at the end of the present cycle, all things shall be reduced to their elements, and the knowledge of the way of salvation shall perish with all things else, then, in the new world that shall spring up, another Buddha will appear, again to reveal to the renascent beings the way to Nirvana. Gautama foretold that Mitraya, one of his earliest adherents, should be the next Buddha† (the Buddha of the future), and he gratified several of his followers with a like prospect in after-cycles. The Buddha was thus no greater than any mortal may aspire to become. The prodigious and supernatural powers which the legends represent him as possessing, are quite in accordance with Indian ideas; for even the Brahmans believe that by virtue, austerities, and science a man may acquire power to make the gods tremble on their thrones.

The Buddha, then, is not a god; he is the ideal of what any man may become; and the great object of Buddhist worship is to keep this ideal vividly in the minds of the believers. In the presence of the statue, the tooth, or the footprint, the devout believer vividly recalls the example of him who trod the path that leads to deliverance. This veneration of the memory of Buddha is perhaps hardly distinguishable, among the ignorant, from worship of him as a present god; but in theory, the ritual is strictly commemorative, and does not necessarily involve idolatry, any more than the garlands laid on the tomb of a parent by a pious child. See TOPE.

The prayers addressed to the Buddha are more difficult to reconcile with the belief in his having ceased to exist. It is improbable, indeed, that the original scheme of Buddhism contemplated either the adoration of the statues of the Buddha, or the offering of prayers to him after his death. These are an after-growth—accretions upon the simple scheme of Gautama, and in a manner forced upon it during its struggle with other religions. For, a system of belief that seeks to supplant other systems, finds itself enticed to present something to rival and outdo them, if possible, in every point. Even the Christian church, in the middle ages, adopted with this view many of the rites and legends of paganism that were quite inconsistent with its own character; merely casting over them a slight disguise, and giving them Christian names. Prayer, too, is natural to man—an irrepressible instinct, as it were, and had to be gratified. And then the inconsistency in uttering prayers when there is no one to hear or answer, glaring as it appears to us, is by no means great to the eastern mind. Prayers, like other formulas, are conceived less as influencing the will of any superior being to grant the request, than as working in some magical way—producing their effects by a blind force inherent in themselves. They are, in short, mere incantations or charms. Even the prayers of a Brahman, who believes in the existence of gods, do not act so much by inclining the deity addressed to favor the petitioner, as by compelling him through their mysterious potency—through the operation of a law above the will of the highest gods. The Buddhist, then, may well believe that a formula of prayer in the name of "the venerable of the world" will be potent for his good in this way, without troubling himself to think whether any conscious being hears it or not.

The element in Buddhism which more than any other, perhaps, gave it an advantage over all surrounding religions, and led to its surprising extension, was the spirit of universal charity and sympathy that it breathed, as contrasted with the exclusiveness of

* The quantity of flowers used as offerings is prodigious. A royal devotee in Ceylon, in the 15th c., offered on one occasion 6,480,320 flowers at the shrine of the tooth. At one temple it was provided that there should be offered "every day 100,000 flowers, and each day a different flower."

† One who is on the way to become a supreme Buddha, and has arrived at that stage when he has only one more birth to undergo, is styled a *Bodhisatva* (having the essence of knowledge; a mere candidate for Nirvana is an *arhat* (venerable).

caste. In this respect, it held much the same relation to Brahmanism that Christianity did to Judaism. It was, in fact, a reaction against the exclusiveness and formalism of Brahmanism—an attempt to render it more catholic, and to throw off its intolerable burden of ceremonies. Buddhism did not expressly abolish caste, but only declared that all followers of the Buddha who embraced the religious life were thereby released from its restrictions; in the bosom of a community who had all equally renounced the world, high and low, the twice-born Brahman and the outcast were brethren. This was the very way that Christianity dealt with the slavery of the ancient world. This opening of its ranks to all classes and to both sexes—for women were admitted to equal hopes and privileges with men, and one of Gautama's early female disciples is to be the supreme Buddha of a future cycle—no doubt gave Buddhism one great advantage over Brahmanism. The Buddha, says M. Müller, "addressed himself to castes and outcasts. He promised salvation to all; and he commanded his disciples to preach his doctrine in all places and to all men. A sense of duty, extending from the narrow limits of the house, the village, and the country, to the widest circle of mankind, a feeling of sympathy and brotherhood towards all men, the idea, in fact, of humanity, were first pronounced by Buddha." This led to that remarkable missionary movement, already adverted to, which, beginning 300 B.C., sent forth a succession of devoted men, who spent their lives in spreading the faith of Buddha over all parts of Asia.

In the characteristic above mentioned, and in many other respects, the reader cannot fail to remark the striking resemblance that Buddhism presents to Christianity, and this in spite of the perverse theory on which it is founded. So numerous and surprising are the analogies and coincidences, that Mrs. Speir, in her book on *Life in Ancient India*, "could almost imagine that before God planted Christianity upon earth, he took a branch from the luxuriant tree, and threw it down to India."

It would be superfluous to attempt here any formal refutation of the religion of the Buddha. To the readers of this work, the fundamental errors of the theory will be apparent enough. By giving prominence to the extravagances and almost inconceivable puerilities and absurdities with which the system has been overloaded, it would have been easy to make it look sufficiently ridiculous, But this is not to depict, it is to caricature. It is only too common for Christian writers to treat of heathen religions in such fashion. The only fair—the only *true* account of any religion, is that which enables the reader to conceive how human beings may have come to believe it and live by it. It is this object that has been chiefly kept in view in the preceding meager sketch of a vast subject. Those who wish to pursue it further are referred to Spence Hardy's *Manual of Buddhism*, and his *Eastern Monachism*, consisting chiefly of translations from the sacred books used in Ceylon; to J. Barthelemy Saint-Hilaire, *Le Bouddha et sa Religion;* and especially to a complete and elaborate digest by C. F. Koeppen of Berlin, in two vols.—*Religion of the Buddha*, and *Lamaist Hierarchy of Thibet.*

BUDDING, sometimes called INOCULATION, is an operation analogous to Grafting (q.v.), or indeed may be regarded as merely a particular mode of grafting, in which a leaf-bud is used as a graft instead of a young shoot. It is generally preferred for trees which are apt to throw out much gum when wounded, as the plum, cherry, peach, apricot, and stone-fruits in general, also for roses and many other flowering shrubs. The time for it is when the bud is perfectly formed, about or a little after midsummer. The bud to be employed is taken, by means of a sharp knife, from the branch on which it has grown—generally a branch of the former year—a small portion of the bark and young wood being taken with it, extending to about half an inch above and three quarters of an inch below the bud. The woody part is then separated from the bark and bud; but care is to be taken that the bud itself is not injured, which, however, is always the case when the operation is attempted before the bud is sufficiently matured, and is indicated by a hollow left at the bud when the wood has been removed. A longitudinal and a transverse cut are made in the bark of the stock intended to receive the bud, in the form of the letter T; the bark is raised on both sides, for which purpose the handle of the *budding-knife* generally terminates in a thin ivory blade, and the bud is inserted, the bark attached to the bud being cut across so as to join exactly to the transverse cut in that of the stock, that the bud may be nourished by the descending sap. The leaf in the axil of which the bud grew is cut off. The newly-inserted bud is for a time preserved in its place, and prevented from too much access of air by strands of bass-matting. The process just described is distinctively called *shield-budding*, and is the most common method of budding. Other methods are occasionally employed, as *reversed shield-budding*, in which the incisions are in the form of the letter T reversed, which is sometimes practiced with trees of the orange family and others in which there is a very great flow of descending sap; and *scallop-budding*, in which a thin slip of bark is removed from the stock, and a similar slip bearing the bud is placed upon it, the upper edge and one of the lateral edges being made to fit exactly. Scallop-budding may be performed in spring, and if it fails, the ordinary method may be resorted to in summer. B. is also sometimes performed by taking a tube of bark with one or more buds from a small branch, and placing it upon a branch of similar thickness in the stock, from which the bark has been removed.

BUDDLE'A, a genus of shrubs of the natural order *scrophularineæ*, of which many species are known, all natives of the warmer parts of the world, and some of them much

admired for their beautiful flowers. *B. Neemda* has received the praise of being one of the most beautiful plants of India. *B. globosa*, a native of Chili, with downy branches, lanceolate leaves, and globose heads of orange-colored flowers, is hardy enough to endure the climate of most parts of England, and has become a very common ornament of gardens, but in Scotland it needs the protection of the greenhouse or frame.

BUDE BURNER and Bude Light. The B. B., so called from the name of the residence of the inventor, Mr. Gurney, consists of two, three, or more concentric argand burners, each inner one rising a little above the outer. On the same principle, a powerful light is produced by a number of flat flames disposed in concentric circles like the petals of a rose.—The Bude light, also the invention of Mr. Gurney, depends upon introducing oxygen into the center of the flame instead of air, as in the common argand. A light of the most dazzling brilliancy is thus produced. The house of commons is lighted by this means, the brilliancy being softened by the intervention of a ceiling of ground-glass.

BUDGELL, Eustace, an English writer for the *Tatler*, *Spectator*, and *Guardian*. He was under-secretary to Addison, and afterwards a member of the Irish parliament. Still later he was comptroller-general of the revenue in Ireland, from which office he was removed because of a lampoon written by him upon the lord lieutenant. In 1720, he lost £20,000 in the South Sea scheme, and afterwards spent £5000 to get into parliament, but did not succeed. Then he started the *Bee*, a weekly journal of short but stinging life. Lawsuits accumulated, and he ended his troubles by drowning, leaving on his table a slip of paper on which was written "What Cato did, and Addison approved, cannot be wrong."

BUDGET, from the same source as the French *bougette*, means a small bag, and has been used metaphorically to express a compact collection of things, as a budget of news, a budget of inventions, and the like. Water-budgets or buckets were a very honorable blazon on a coat-armorial, as being generally conferred in honor of some valiant feat for supplying an army with water. Guillim, in his *Display of Heraldry*, thinks the three mighty men in David's army who broke into the host of the Philistines, and drew water from the well of Bethlehem, "deserved to have been remunerated with such armorial marks on their coat-armors for their valor."

The term, "The Budget," is in Britain, from long usage, applied to that miscellaneous collection of matters which aggregate into the annual financial statement made to parliament by the chancellor of the exchequer. It contains two leading elements—a statement how the nation's account of charge and discharge stands in relation to the past, and an explanation of the probable expenditure of the ensuing year, with a scheme of the method in which it is to be met, whether by the existing or new taxes, or by loan. The statement of the budget is always an important, sometimes a very exciting occasion; as for instance, sir Robert Peel's adoption of an income-tax in 1842, and his legislation for free-trade in 1846. Another instance is Mr. Gladstone's reduction of the wine-duties and treaty with France in 1860.

BUDHA'NUH, a t. of India, in the British district of Mozuffurnuggur, n.w. provinces, on the route from Kurnoul to Meerut, 43 m. s. from Kurnoul. The surrounding country is wooded and well cultivated, and the bazaar of the town is well supplied. Pop. '72, 6162.

BUDINGTON, William Ives, d.d., b. Conn., 1815; graduate at Yale, and in theology at Andover. He was ordained in 1840, and took charge of the first Congregational church in Charlestown, Mass., remaining there 14 years. He published a history of that church in 1845. In 1855, he took charge of the Clinton avenue church, Brooklyn, New York. Failing health compelled him to relinquish public duties early in 1879, and he died in December. Dr. B. was one of the acknowledged leaders in his denomination.

BÜDOS HEGY, a mountain belonging to the Carpathians, on the eastern border of Transylvania, in lat. 46° 12′ n., and long. 25° 40′ east. It is quite isolated, steep, and of conical shape, densely wooded on the lower slopes, and has an elevation of 7340 feet. it has numerous caverns, that emit sulphurous exhalations, and from its base issue strong sulphur springs.

BUDWEIS, a t. of Bohemia, situated on the Moldau, about 77 m. s. of Prague. B. is well built, is partially fortified, and has an old cathedral, manufactures of woolens, stoneware, machines, lead-pencils, saltpeter, etc. It has also a brisk trade in grain, wood, coals, and salt. There are numerous schools, both for education in the Bohemian and in the German tongue. The Slavic name of B. is *Budejowice*. Pop. '80, 23,845. In the neighborhood is an old feudal fortress, the *Schloss Frauenberg*, one of the seats of prince Schwarzenberg, and a fine new Gothic castle also belonging to the same nobleman. Here he keeps herds of wild swine for the chase.

BUEL, Jesse, 1778–1839; a native of Connecticut, began life as a printer, and established the *Albany Argus* in 1813, continuing as the publisher until 1821, when he retired to a farm and became one of the most successful cultivators in the country. In 1834, he started the *Albany Cultivator*, and subsequently published the *Farmer's Instructor* and the *Farmer's Companion*.

BUELL, Don Carlos, b. Ohio, 1818; a graduate of West Point; served in the Florida and Mexican wars, from 1849 to 1861 assistant adjutant-general in various military departments; in the latter year commanding the department of the Ohio, and in 1862 made maj.gen. of volunteers. He was mustered out in 1864, and resigned his command.

BUENA VISTA, a co. in n.w. Iowa, traversed by the Dubuque and Sioux City railroad, and watered by Coon and other rivers; 576 sq.m.; pop. '80, 7537. Agriculture is the main business. Co. seat, Prairieville.

BUENA VISTA, a small settlement in Coahuila, Mexico, on the San Juan, a tributary of the Rio Grande, 7 m. s. of Saltillo; the site of a battle between the United States forces under gen. Taylor and the Mexicans under Santa Anna, Feb. 23, 1847, the former with 5200 men and the latter with about 20,000. After two days of sharp fighting, Santa Anna was defeated with a loss of nearly 2000; Taylor's loss being 746. The result was due in great part to the superior effectiveness of Taylor's artillery.

BUEN AY'RÉ, in Spanish, or Bon Air in French, an island in that subdivision of the West Indies which runs parallel with the coast of Venezuela. It is in lat. 12° 20′ n., and long. 68° 27′ w., being 30 m. to the e. of Curaçao, which, like itself, belongs to the Dutch. B. A. produces cattle and salt. It measures 20 m. by 4, and contains about 4000 inhabitants. It has a tolerable harbor on its leeward or s.w. side.

BUE'NOS AY'RES, a province of the Argentine Confederation in South America, of which the city B. A. is capital, extends itself along the Atlantic, from the mouth of the Plata to that of the Rio Negro on the 41st parallel; on the n.e., it is washed by the Plata and the Parana as far as the Arroyo del Medio; on the n. and the adjacent section of the w., it touches the province of Santa Fé. Elsewhere, its borders cannot be defined, constantly advancing, by slow and perilous steps, into the domain of the aborigines, for here the contest is not with the wilderness itself, which is a boundless prairie, but with its tenants, who, having an unlimited supply of horses for all purposes, are secured, in their every foray, alike against famine and fatigue. Its area is estimated at 63,000 sq.m., with a pop. of (1882) 612,000. Besides the existing province of the name, it at one time comprised Uruguay or Banda Oriental, Paraguay, Bolivia, and the Argentine Confederation, being originally an appendage of Peru, under the immediate command of a capt.gen., and becoming, in 1775, a separate vice-royalty of itself. Though the first three of these four divisions broke off chiefly in connection with the revolutionary struggle, yet the fourth continued, down to 1853, to recognize the city of B. A. as its head; and the inland states endeavored both by war and diplomacy to re-annex the maritime province to the republic, till, in June, 1860, their object was obtained, and B. A. became once more a province of the Argentine Confederation.

The country approaches so nearly to a plain, that most of the rain which falls is either absorbed or evaporated, or lost in salt-lakes, comparatively little drainage entering the Parana or the Plata. The climate, though on the whole healthy and agreeable, is yet by no means steady or uniform. Every wind, in general, has, to a remarkable degree, its own weather—sultriness coming from the n., freshness from the s., moisture from the e., and storm from the w.; and besides the periodical heats of every summer, successive years of more than ordinary drought occur. Agriculture, properly so called, is followed chiefly in the more temperate and humid districts of the eastern coast; while the interior presents almost uninterrupted pasturage to countless herds of horses and cattle. Under these circumstances, the business of grazing and hunting combined occupies or interests the great bulk of the population—a business that renders the province, whether as to the disposal of its productions or as to the supply of its wants, peculiarly dependent on that external commerce, which, throughout the whole of Spanish America, has naturally been identified with political freedom. Let it be added that the Indians are intractable, and that the Africans, few in number at best, are principally menials; and it is seen at once why, in spite of national jealousies and sectarian prejudices, immigration from Europe has been not only tolerated by public opinion, but also encouraged by legislative enactments. Moreover, a comparatively congenial climate, as a recommendation to foreigners, has powerfully seconded the efforts of liberality and patriotism. It is perhaps mainly owing to this cause, which is common alike to Chili and to B. A., that these two districts, notwithstanding their full share of wars and troubles, have so decidedly outstripped the other fragments of the same colonial empire in all the elements of liberty and civilization. Hence their higher importance in the eyes of Europeans in general, and of Englishmen in particular. B. A. is the largest, most populous, and most flourishing of the provinces which comprise the Argentine Confederation. Numerous railways traverse it, emanating from the city of B. A., and extending to other parts of the republic, The annual immigration into B. A. is from 20,000 to 40,000.

BUE'NOS AY'RÉS, a city of South America, on the right bank of the Plata, which here, at a distance of 150 m. from the open sea, is 36 m. across. It stands in lat. 34° 36′ s., and long 58° 24′ west. Its disadvantages as a maritime town are great; the flood-tides of the ocean, when backed by easterly winds, being apt to make the estuary overflow its banks; and again, when westerly winds prevail, the estuary loses both width and depth. Monte Video, on the opposite shore, possesses a better harbor, and is nearer to

the Atlantic, nor can it be doubted that, but for the greater facilities of B. A. in carrying on an inland trade, the former town would have proxed a dangerous rival. Steam is rapidly placing both upon more equal terms. Of the trade, however, with Chili by Mendoza and the Andes—a trade which must always be carried on by land—B. A. must still command the monopoly. So familiar had B. A. become with land-carriage on an extensive scale, that its merchants, when blockaded in front during a war with Brazil, established, as it were, a new port of entry in the mouth of the Salado or Saladillo, at a distance of at least 150 miles. As a city, B. A. labors under some peculiar disadvantages. Its supplies of fresh water are received from the Plata in rudely constructed carts, though a thorough scheme of water-supply and drainage is now being carried out. Its immediate territory, purely alluvial, is almost as destitute of timber as of stones—the latter being brought either as ballast from Europe, or as freight from Martin Garcia, an island on the opposite side of the estuary; and the former from the province of Entre Rios, and from the islets of the Uruguay and the Parana. Fuel is almost as scarce as building material—peach-trees and the withered thistles of the prairies yielding the only indigenous supplies. B. A., which appears to deserve its name of *good airs*, contains (1881) 289,000 inhabitants—about a third of whom are of European birth or descent. Among the Europeans the vast majority are Spanish, Italian, French, and British. B. A. publishes newspapers in French, English, Italian, and German, as well as in Spanish. The city is partitioned into blocks of about 150 yards square, by granite-paved streets. New houses are everywhere springing up; tramways traverse it in every direction; and the value of property has enormously increased. The principal buildings are the cathedral and its dependent churches. Episcopalian and Presbyterian chapels, a foundling hospital, an orphan asylum, the university, a military college, several public schools, and the government offices; there are also printing establishments, and manufactories of cigars, carpets, furniture, and boots and shoes. The exports consist of precious metals, hides, beef, wool, skins, tallow, and horse-hair; and the imports of cottons, linens, woolens, jewelry, perfumery, and deals. The custom-house dues, which in 1860 were $3,000,000, in 1870 had increased to $13,000,000. The value of imports in 1873 was £11,886,861, and of exports, £6,886,506. B. A. was founded in 1535; but having subsequently been twice destroyed by the Indians, it ought, in reality, to date only from 1580. In the beginning of the present century, it achieved, with very little aid from home, two triumphs over England. In 1806, one British force, which had just captured the city, was obliged to surrender; and in 1807, another which attempted to recover the place, was repulsed with heavy loss; and these successes over so formidable a foe emboldened the colonists, three years afterwards, to throw off the yoke of Spain. B. A. is connected with Santiago, Chili, by the Transandine railway.

BUFFALO, *Bos bubalus*, an animal of the ox tribe, very important and useful to man. It is a native of the East Indies, where it has been long domesticated, and from which it was carried to Egypt and to the south of Europe. It was introduced into Italy about the close of the 6th c. A.D., and is now very generally used as a beast of draught and of burden in that country, as it is also in India.

The B. is larger than the ox, and its limbs are stouter. Its form is more angular and clumsy; the head is larger in proportion to the size of the body; and the forehead is rather convex, and higher than broad; the dorsal line rises into a considerable elevation above the shoulders; the dewlap and the tail resemble those of the ox; the horns are large, slightly compressed, recline towards the neck, and have their points turned up. It is characteristic of the B., when walking or running, to carry the head with the muzzle projecting straight forward, and the horns laid back on the shoulders. The hair is irregular and bristly, often very thin, so that the smooth brown hide "shines with an unpleasant polish in the sunlight." In this as in other respects, the animal is adapted for marshy situations, which it naturally affects; preferring for its food the rank coarse herbage which they afford, delighting to immerse itself in water till only its head appears above the surface, in which condition it will remain for hours, and often enveloping itself in mud as a protection against insects. On account of these propensities, the buffaloes used as beasts of burden in India are seldom laden with any goods liable to be spoiled by water, as the animal is always ready to take an opportunity of lying down with his load in any river or pond which presents itself. In Italy, the B. seems nowhere more at home than in the Pontine marshes and the pestilential Maremma. The very regions where malaria is most prevalent seem to be those most adapted to its constitution.

The B. is a very powerful animal, much more powerful than the ox, and capable of dragging or carrying a far heavier load. The female yields a much greater quantity of milk than a cow, and of excellent quality. It is from B. milk that the *ghee* or semi-fluid butter of India is made. The hide is greatly valued for its strength and durability, but the flesh is very inferior to that of the ox.

The B. exhibits a considerable amount of intelligence. In a state of domestication, it is capable of becoming very docile. In the s. of Europe, it is generally managed by a ring passed through the cartilage of the nose, but in India by a mere rope. The Indian driver rides upon a B.; but these animals keep so closely together as they are driven along, that, if necessary, he walks from the back of one to that of another perfectly at his ease. In a wild state, the B. is savage and dangerous, and even in domesti-

cation it is apt to resent injury. The native princes of India make buffaloes and tigers fight in their public shows; and the B. is more than a match for the tiger, even in single combat. The appearance of a tiger excites a herd of buffaloes, much as we see oxen excited by the approach of a dog; and if his safety is not secured by flight, they kill him, tossing him from one to another with their horns, and trampling him with their feet.

The B. is used in some parts of the east in the shooting of waterfowl, being trained to the sport, and sold at a considerable price. The sportsman conceals himself behind the B., which, being a familiar sight, is not alarming to the birds.

The Cape B., *Bos Caffer*, is generally regarded as a distinct species. It seems never to have been reduced to the service of man, although there is reason to believe it to be very capable of domestication. The horns are very large; they spread horizontally over the top of the head, and are then bent down laterally, and turned upwards at the point. The head is carried, as by the common B., with projecting muzzle and reclining horns, but the bases of the horns nearly meet on the forehead, where they are from 8 to 10 in. broad. The length of a full-grown Cape B. is about 8 ft. from the root of the horns to the tail, and the height 5½ feet. This animal is regarded as more formidable than any other in South Africa; and the hunter will more readily risk an encounter with a lion than offer any provocation to a B. without great advantages for the combat, or great facilities for escape. The B. is still found in large herds in the interior of South Africa, but in Cape Colony, where it was once plentiful, it has now become comparatively rare. The hide is so thick and tough that the Caffres make shields of it, impenetrable to musket-shot: and the balls used by the huntsmen in shooting the animal are mixed with tin, and yet are often flattened by the resistance. The Cape B. grazes chiefly in the evening, and lies in woods and thickets during the day.

An attempt has been made to establish a genus, *bubalus*, naving the common B. for its type; but the characters lack precision, and the limits are uncertain.—The *buffalo* of the Anglo-Americans is the American bison. See Bison.

BUFFALO, a co. in central Dakota, on the Missouri river; 750 sq. m.; pop. '80, 63. Iron ore has been discovered.

BUFFALO: co. Kan. See page 882.

BUFFALO, a co. in central Nebraska, on the Platte river; 850 sq.m.; pop. '80, 7531. Soil fertile. The Union Pacific railroad passes through. Co. seat, Gibbon.

BUFFALO, a co. in w. Wisconsin, on the Mississippi and Chippewa rivers. Grain and wool are the main products; 650 sq.m.; pop. '75, 14,219; in '80, 15,528. Co. seat, Alma.

BUFFALO, a city of the state of New York, standing at the mouth of Buffalo river, which enters lake Erie within 2 m. of its outlet, the Niagara river. In 1801, when B. was founded, the basin of its fresh-water sea contained certainly fewer than 50,000 inhabitants, and seemed cut off from commercial communication by the Niagara falls on the e. and the currents of the Detroit and St. Clair on the west. But these and other natural disadvantages have been made to vanish. The construction of piers and breakwaters in the river and at its mouth have removed the bar, and given B. one of the best harbors on the lakes. Steam has brought lakes Huron, Michigan, and Superior within easy reach. Its commerce is large, the grain trade being the most important item in it. The receipts of grain and flour during the decade ended in 1874 amounted to 522,874,944 bushels. There are more than 30 elevators in B., with storage capacity for upwards of 7,000,000 bushels. Next to the traffic in grain is that in live-stock. In 1874, 504,594 cattle, 783,800 sheep, 1,431,800 hogs, and 21,937 horses, amounting in value to nearly $60,000,000, passed through Buffalo. British improvements along the Niagara and the St. Lawrence, available as they are for sea-going ships, have rendered B. a maritime emporium. The Erie canal, 364 m. long, has connected B. as its terminus with the tide-waters of the Hudson; while three other enterprises of the kind, commencing respectively at Erie, Cleveland, and Toledo, have linked lake Erie at three or rather four points with the Ohio, and through it with the Mississippi. Since about 1862, its lake commerce has much decreased, owing to the increase of railway facilities, and manufacturing industries have taken the lead. Among manufactures, that of iron is the chief. Ship-building is also largely carried on, and there are extensive wool-factories and numerous saw-mills. The rise of B. has been remarkably rapid; in 1810, there were 1508 inhabitants; 1830, 8653; 1850, 42,261; 1870, 117,714; and in 1875, 134,573. The city debt in 1878 was $7,509,257; and the valuation, $99,975,575. In 1814, the British burned Buffalo. In 1825, the Erie canal was opened.

B. is situated in lat. 42° 53′ n., and long. 78° 55′ west. It is regularly built. Its streets are straight and broad—Main street, in particular, being 2 m. long and 120 feet wide; and its squares, which are 3 in number, are shaded by rows of trees. The most prominent public buildings are the city and county hall, erected at a cost of $2,000,000, custom-house, post-office, arsenal, penitentiary, and an asylum for the insane. There are nearly 80 churches, a university, 8 daily newspapers, several libraries, etc. It is divided into 5 wards, and is governed by a mayor and council annually elected.

BUFFALO (*ante*), city, a port of entry, and the seat of justice of Erie co., N. Y., in 42° 53′ n., 78° 55′ w., at the foot of lake Erie, at the mouth of the Buffalo river and at the head of Niagara river, which is here crossed by an iron bridge. The city has a water

front of about 5 m., running 2½ m. along the shore of the lake, and 2½ m. along Niagara river. It is connected with Goderich on lake Huron by the Buffalo and Lake Huron railroad; with Detroit by the Great Western railway; with Toronto and Montreal by the Grand Trunk railway. The climate is pleasant and healthful; the streets, broad and generally lined with trees, are well paved, lighted, and supplied with sewers. There are many fine residences with attractive grounds, and numerous squares and public places. A combination of parks and pleasure grounds has been laid out, extending to over 500 acres. It comprises three sections, situated respectively in the northern, western and eastern parts of the city, which, with the connecting boulevards, afford a drive of nearly 10 miles. In population Buffalo is the third city in New York, and the thirteenth in the United States. It was founded in 1801, became a military post in 1813, and was burned by the British on the last day of the same year. After the war the place was rebuilt, and in 1832 it attained the rank of a city. In 1820, it contained 2095 inhabitants. After the opening of the Erie canal in 1825, its growth was rapid, the population being 8653 in 1830; 18,213 in 1840; 42,261 in 1850; 81,129 in 1860; 117,714 in 1870; 134,238 in 1875, and 155,137 in 1880. A portion of the river front is a bold bluff 60 ft. above the lake and the Erie canal, which passes near it. There are 5 public squares, Niagara, Lafayette place, Washington, Franklin, and Delaware place. The principal streets are Main street, about 3 m. in length, Niagara street, 4 m., and Delaware street, 3 miles. The most important public buildings are the city and county hall, a granite structure, erected at a cost of over $2,000,000, in the form of a double Roman cross with a tower 245 ft. high; the United States custom-house and post-office; the state arsenal, the Erie co. penitentiary, which is one of the 6 penal establishments of New York; and the state asylum for the insane, an edifice which cost about $3,000,000, and has a front of 2700 ft. and a capacity for 600 patients. There are 101 churches, the most imposing edifices being St. Joseph's cathedral (Roman Catholic) and St. Paul's (Episcopal). The churches are divided among the various denominations as follows: 22 Roman Catholic, 21 German Lutheran and Evangelical, 12 Episcopal, 15 Methodist, 12 Presbyterian, 11 Baptist, 4 Mission, 2 Jewish, 1 French Protestant, 1 Congregational, 1 Unitarian, 1 Universalist, and 1 Friends'. The Forest Lawn cemetery in the suburbs contains 75 acres, tastefully laid out. There are 11 daily newspapers, 6 in English and 4 in German, 23 weeklies, and 7 periodicals issued monthly. The educational institutions comprise a state normal school, 50 public schools with an average of 353 teachers and 21,808 pupils, and a number of collegiate schools and academies. Among other educational institutions are Canisius college, founded by the Jesuit fathers; St. Joseph's college, conducted by the Christian brothers; Martin Luther college (theological); St. Mary's academy and industrial school for girls; and the medical college of the university of Buffalo. The charitable institutions of the city are numerous. The Buffalo orphan asylum, founded in 1835, occupies a fine building in Virginia street. The St. Vincent's asylum for orphan girls is under the care of the sisters of charity. The St. Joseph's asylum for orphan boys, founded by the Roman Catholic church, has a reformatory institution connected with it. The church charity foundation (Episcopal) supports a home for aged and destitute females opened in 1858, and an orphan ward organized in 1866. The St. John's orphan home is under the care of the Evangelical Lutheran church. The Ingleside home was organized in 1869 for the purpose of reclaiming erring women. Among other charities are the St. Mary's asylum for widows, foundlings, and infants; the Buffalo general hospital in High street; the Buffalo association for the relief of the poor; and a homeopathic hospital founded in 1872. B. has 3 national banks, 8 state banks, and 5 savings banks. The Young Men's association has a library of 41,000 volumes, and real estate valued at about $250,000. This society owns St. James hall, which is greatly in demand for concerts and lectures; and their large library building is occupied by the Buffalo historical society with its large library and cabinet; by the society of natural sciences, which has made an extensive collection of minerals and fossil casts; by the academy of fine arts; and by the mechanics' institute. The Young Men's Christian union and the German Young Men's association have good libraries. The Grosvenor library contains about 25,000 volumes of valuable reference works.

The city government is composed of a mayor, a common council of 26 members (2 from each of the 13 wards), a treasurer, controller, city attorney, superintendent of education, city engineer, overseer of the poor, and 3 assessors. It is often claimed that B. is the healthiest city of the United States, having the best water and the most complete sewerage; its water-supply is procured from the Niagara, through a tunnel extending almost to the middle of the river. The police department, with a force of 174 men, is under the control of a board of three commissioners. The city has a paid fire department, 3 volunteer hook-and-ladder companies, and a volunteer protection company; a fire and police alarm telegraph, with 70 m. of wire, 68 signal-stations, and 27 alarm-gongs. The telephone has been introduced and extends to various parts of the city. The gas of B. is supplied by three private companies. There are several lines of street railroads. The total debt of the city in '80, was $8,211,934; the assessed valuation of property was $92,256,315; (real estate, $84,396,770; personal property, $7,859,545.

The position of B. on the great water and railway channels of communication between the west and the east gives it a large commercial importance. Its harbor is capacious,

and is protected by extensive breakwaters. The city is the center of an important system of railroads: it is the eastern terminus of the Lake Shore and Michigan Southern railroad, of the Canada Southern, and a branch of the Grand Trunk railroad of Canada; it is the western terminus of the Erie canal, the New York Central railroad, and a division of the Erie railway; and other lines converge here. There is a board of trade, organized in 1844 and incorporated in 1857. The immense quantities of grain moving from western states to the sea-board constitute the most important feature of the commerce of the city. The facilities for handling and storing it are unexcelled by those of any other city on this continent. The first grain elevator was built in 1843 by Joseph Dart, and thirty years from that date, in 1873, there were 32 elevators, with a capacity for handling 3,000,000 bushels a day. The record of receipts and exports is as follows: receipts, 1836–45, 41,851,483 bushels; 1846–55, 174,717,437 bushels; 1856–65, 432,390,318 bushels; 1866–75, 571,255,254 bushels. During the same length of time the exports kept pace with the receipts. Many of these elevating warehouses are costly structures of stone, or of iron and brick; several of them have grain "driers" attached. The live stock trade of B. is second only to the grain trade, but will probably exceed it before long. For the accommodation of this branch of business the New York Central railroad company has built large yards in the eastern suburbs; these yards are well sheltered, paved, watered, and taken care of with strict regard to cleanliness. In the amount of this business this city has third rank among the cities of the United States. B. has a large trade in anthracite and bituminous coal, received from Pennsylvania and distributed both e. and w.; great improvements have been made lately for handling and shipping this article. The rapid growth of the coal trade may be seen from the fact that the lake shipments westward during the season of 1879 amounted to 612,976 tons against 325,676 tons in 1878. The lumber and timber trade is large, although want of harbor and proper storage has driven a great part of it to Tonawanda on the Niagara river, about ten miles below Buffalo. The receipts in 1879 amounted to 207,531,000 ft., exceeding those of 1878 by 30,000,000 feet.

The manufacturing interests of B. are extensive, and have grown with marked rapidity in recent years, especially the manufacture of iron, which is carried on in more than 30 large establishments, employing 5000 men. The leading establishments are blast furnaces, rolling-mills, foundries, breweries, tanneries, manufactories of agricultural implements, and flour-mills. Of the last-named there are eleven, with a yearly capacity of 839,000 barrels; the average annual production of flour being about 250,000 barrels. Wooden ship building was formerly carried on here, but it has been superseded by iron ship building. Two extensive establishments are devoted to this industry; these have constructed the finest lake steamers, besides supplying the government with a number of iron revenue vessels. The West Shore Railway ends at B.

BUFFALO'RA, a small t. of Lombardy, about 25 m. n.n.w. of Pavia, on the Ticino, here crossed by a bridge. The Austrians commenced the Italian campaign of 1859 by entering Piedmont at this point. The bridge was partially blown up by Austrian engineers. Pop. 1250.

BUFFET, an article of furniture formerly serving the same purpose as a sideboard, which has now superseded it. B. is the name given in France to a refreshment bar.

BUFFIER, CLAUDE, 1661–1737; a French psychologist and metaphysician, for the most of his life a lecturer in the Jesuit college in Paris. His best known work is *Traite des Vérites Premieres*, in which he intended to discover the ultimate principles upon which all knowledge is based. He wrote also on the elements of metaphysics, and a French grammar on a new plan.

BUFF LEATHER is usually made out of salted and dried South American light ox and cow hides. After being limed in the usual way, they are unhaired and rounded, so that only the best part of the hide is made into buff leather. The grain and flesh being then scraped or cut off, the true cuticle, which is of a flexible fibrous nature, alone remains. The hide is next sprinkled over with cod-oil, and placed in the *stocks*, where it is worked for about 15 minutes. Having been taken out and partially dried, it is again submitted to a similar process of oiling and stocking; and during the first day, these operations may be repeated six times, decreasing daily for about a week, when one oiling and stocking in a day is sufficient. The hides are then placed in a stove, and subjected to a process called "heating off," after which they are scoured and rendered free from oiliness by being soaked in a strong lye of carbonate of potash. They are next worked well in the stocks, hot water being poured copiously upon them until the water runs off pure. Having been dried, they are subjected to a process called *grounding*—i.e., they are rubbed with a round knife, and also with pumice-stone and sand, until a smooth surface is produced. The leather, which is very pliant, and not liable to crack or rot, is now ready for the market, and is generally used for soldiers' belts and other army purposes.

During the early part of this century, the principal seat of the B. L. manufacture was in the neighborhood of Edinburgh, one manufacturer turning out, previous to the battle of Waterloo, about 1300 hides per week. In peaceable times, the demand for B. L. is comparatively small, and the manufacture is now almost confined to London and the neighborhood, where the raw material is most readily procured, and the demand

for the manufactured article is greatest. The natural color of the leather is light-yellow, but for some purposes it is bleached white. The precise chemical operation of the oil in the process of the manufacture is rather obscure, but as no glue can be got from hide that has been made into buff, the gelatine of the hide must have entered into combination with some of the constituents of the oil, and had its nature completely changed.

BUFFO (Ital. from corrupt Latin *buffa*, a slap on the cheek, as practiced by clowns and mountebanks in farces), an Italian theatrical term applied to an actor or operatic singer who takes the light or humorous part in an opera or play. A burlesque opera is called *opera buffa*, and a burlesque play, *commedia buffa*.

BUFFON, George Louis Leclerc, Comte de, one of the most famous naturalists and writers of the 18th c., was b. at Montbard, in Burgundy, Sept. 7, 1707. He studied law at the college of Jesuits at Dijon, but showed so marked a predilection for astronomy and mathematics, that his father allowed him to follow his own inclinations. At Dijon, he became acquainted with lord Kingston, whose tutor, a man of learning and taste, directed the mind of B. to the study of the sciences. With lord Kingston and his tutor, B. traveled through France and Italy, and came to England, where, to improve his knowledge of our language, he translated Newton's *Fluxions* and Hales' *Vegetable Statics*. In 1733, he wrote several original essays, which gained notice in the academy, of which he had been made a member. His general love of science received a definite impulse toward zoology by his appointment, in 1739, as intendant of the royal garden and museum. Hitherto zoology, consisting of a series of unconnected observations and fruitless attempts at classification, had been commonly regarded by educated readers as a dry study, and by savans as play-work. B. first conceived the idea of making it attractive to the first of these classes, and of securing for it, at the same time, the respect of the second. His plan was assuredly comprehensive enough, since he aimed at nothing less than a collection of all the separate known facts of physical investigation, and a systematic arrangement of these, to assist the author in forming a theory of nature; but B. possessed neither the science nor the patience necessary for such a task. Endowed, however, with a brilliantly rhetorical imagination, and always inclined to deliver himself from doubts and ignorance by sparkling hypotheses, the elaboration of which cost him little trouble, he contrived to produce a work which, if not severely scientific in its method, at least shone with what many then conceived to be the brightest literary luster. However, it is not to be denied that many of his views are very ingenious, although later researches have completely exploded them. The *Natural History* of B. made an epoch in the study of the natural sciences, though it has now little or no scientific value. His attempted explanations of natural phenomena were opposed by Condillac, who, with Helvetius, Diderot, D'Alembert, and others, also ridiculed, with a certain degree of justice, the excessive pomp of style used by Buffon. The most insignificant part of B.'s treatise is the mineralogy, for which he was quite unqualified by the deficiencies of his chemical, mathematical, and physical knowledge. The systematic and anatomical arrangement of the mammalia was executed by Daubenton, the colleague of Buffon. B.'s works passed through numerous editions, and several were translated into most of the languages of Europe. The best complete edition is the *Histoire Naturelle Générale et Particulière*, in 36 volumes (Par. 1749–88.) After receiving several high honors, being elevated to the rank of comte de B. by Louis XV., and treated with great distinction by Louis XVI., B. died in Paris, April 16, 1788. In person and carriage, B. was noble; as a Parisian academician, and a self-complacent, theoretical naturalist, dressed in courtly style, pursuing his pleasant studies in the *allées* of the royal garden, and largely participating in the vices of his time, B. was quite a model of a French philosopher of the 18th century. His son, Henri Leclerc, comte de B., b. 1764, was attached, at the outbreak of the revolution, to the party of the duke of Orleans, and fell under the guillotine. His last words were: *Citoyens, je me nomme Buffon.*

BUFFOON (Fr. *bouffon*), a low jester. The Italian *buffo* (from *buffa*, a farce) is the name given to a comic singer in an opera. In the corrupt Latinity of the middle age, *buffa* meant a slap on the cheek; and in the Italian, *buffare* signifies the puffing of wind through the mouth. It is probably from the favorite trick played by clowns in farces—one swelling out his cheeks with wind, the other slapping them, so as to make a ludicrous explosion—that the terms *buffones* in Latin, *buffoni* in Italian, *bouffons* in French, and in English *buffoon*, were derived. In Italy, the *buffo cantante* is distinct from the *buffo comico;* the former having greater musical talent, and sustaining a more important part, the latter having greater license in jocoseness The voice of a *buffo cantante* is generally a bass, but sometimes a tenor buffo is introduced.

BUFORD, John, 1826–63; b. Ky.; graduate of West Point, was capt. of dragoons in 1859. In the war of the rebellion he served on the union side, and was one of the most conspicuous and useful of cavalry officers, participating in many engagements, in one of which he was wounded. He rose to maj.gen. of volunteers.

BUG, a name applied to a large family of insects, *cimicidæ*, of the order *hemiptera* (q.v.), suborder *heteroptera*, and often still further extended in its signification so as to

include the whole of that suborder, the insects of the section *geocorisæ* being designated land-bugs, and those of the section *hydrocorisæ*, water-bugs, the latter including water-scorpions, boat-flies, etc. All these insects, and particularly the land-bugs, although some of them are radiant in beautiful colors, have a strong resemblance in form and structure to the annoying and disgusting house B. or bed B. (*cimex lectularius*) The statement that this insect was introduced into England with timber brought from America to rebuild London after the great fire of 1666, must be rejected as erroneous; for although it appears to have been comparatively rare in England, it was well known in some parts of Europe long before that time, and is mentioned by Dioscorides. The bed B. is destitute of wings—an anomalous peculiarity, as the insects of its order, and even of the same family, are generally furnished with them. The body is very flat, of a somewhat oval form; the whole insect is of a dirty rust color, emits an offensive odor, and is about three sixteenths of an inch in length; the legs are moderately long, and capable of being employed for pretty rapid motion; the antennæ are thread-like and very slender, about half the length of the body; the mouth is formed for suction alone, and is furnished with a sort of proboscis, which is three-jointed, forms a sheath for the true sucker, and when not in use is recurved under the head and thorax. The B. lurks during the day in crevices of walls, of bedsteads, and of other furniture, but is sufficiently active during the night; and when it finds opportunity, sucks blood until it distends itself. It seems, however, to be capable of subsisting long without food. Young bugs resemble their parents in most things, except size and the want of *elytra*, insects of this order not undergoing such marvelous transformations as those of some other orders. The best preventive of bugs in a house is *scrupulous attention to cleanliness;* but where the nuisance exists, it is not easily removed, and various means are employed for this purpose, of which one of the best and safest is thorough washing with spirit of turpentine, although recourse is even had to washing with a solution of corrosive sublimate.—Other species of B. (*cimex*) suck the blood of some of the inferior vertebrate animals, as pigeons, swallows, bats, etc.; but the greater number of insects of the B. family live by sucking the juices of vegetables. A small species (*tingis pyri*), which sucks the leaves of the pear-tree, is very destructive in some parts of Europe, where it is popularly called the *tiger*. Some of these winged wood-bugs or field-bugs are capable of inflicting very painful wounds. Flying-bugs, "enormous and fetid," are among the pests of India. Night is the time of their activity. Warm countries generally have winged bugs of great size and beauty; but if touched or irritated, they "exhale an odor that, once perceived, is never after forgotten." A winged B., as large as a cock-chafer, lodges in the thatch and roofing of houses in Chili, and sallies forth at night, like the bed B., to suck blood, of which it takes as much as a common leech.—It is worthy of notice that a species of field B. (*acanthosoma grisea*), a native of Britain, is one of the few insects that have yet been observed to show affection and attention to their young. De Geer observed the female of this species, which inhabits the birch-tree, conducting a family of thirty or forty young ones as a hen does her chickens, showing great uneasiness when they seemed to be threatened with danger, and waiting by them instead of trying to make her own escape.

BUG, or Bog. There are two rivers of this name in Russian Poland. The Western B., the largest tributary of the Vistula, rises in Austrian Galicia, and after a course of about 450 English miles, and receiving numerous tributaries, it joins the Vistula at the fortress of Modlin, near Warsaw. It is navigable for a considerable distance. The Eastern B., the Hypanis of the ancients, rises in Podolia, and flows s. into the estuary of the Dnieper. Its length is more than 400 miles. It is navigable for small-craft as far as Wosnessensk. At the junction of the Ingul with the B., stands the city of Nicolaiew (q.v.).

BUGEAUD, Marshal, was b. at Limoges, in France, Oct. 15th, 1784. In his 20th year he entered the army as a private. His conspicuous bravery in the Prussian, Polish, and Spanish campaigns gained him rapid promotion. Shortly before the fall of Napoleon, B. was made a col., and in 1815 commanded the advance-guard of the army corps of the Alps. He afterwards retired to his estate, but was called into public life by the July revolution of 1830. He was elected deputy for Perigueux, and gained the esteem of Louis Philippe, who created him a marshal. In 1835, he voted against electoral reforms and universal suffrage, denounced "the tyranny of the press," and soon contrived to make himself very unpopular. In Dec., 1840, he was appointed governor-general of Algiers. He immediately set about organizing the celebrated irregular force known as the zouaves, and in a few years the French arms were everywhere triumphant over the Arab tribes. The cruelty of some of B.'s proceedings excited strong feelings of reprobation at the time, as well in France as in Europe generally. In 1844, he gained a victory over the emperor of Morocco's forces at Isly, for which he was created duc d'Isly. In the revolution of Feb., 1848, marshal B. had the command of the army in Paris, and would have dissuaded the king from signing the act of abdication; but panic made such counsel useless. Among all the friends of Louis Philippe, marshal B. seems to have been the only man who preserved firmness and presence of mind. When Louis Napoleon became president, he intrusted the chief command of the army of the Alps to B., who died of cholera in Paris, June 9th, 1849.

BUGENHAGEN, Johann, surnamed *Pomeranus,* or Dr. Pommer, one of Luther's chief helpers in the reformation, was b. at Wollin, near Stettin, in Pomerania, 1485; studied at Greifswald, and as early as 1503 became rector of the Treptow academy. There he lived quietly, fulfilling the duties of his office until 1520, when his religious views were changed by reading Luther's little book, *De Captivitate Babylonicâ.* B. was now seized, as it were, by the zealous spirit of the reformation, and, to avoid the persecutions of the Catholic party, he betook himself to Wittenberg, where his talents procured for him in succession several high positions. B.'s remarkable philological and exegetical powers were of great service to Luther in his translation of the Bible. In 1525, he opened the controversy between Luther and Zwingli by a treatise against the latter, to which Zwingli ably replied. He possessed a superior talent for organization, establishing churches in Brunswick, Hamburg, Lubeck, and Pomerania, In 1537, he was called to Denmark by Christian III. to reform the ecclesiastical establishments of that country. He accomplished this so admirably, that the Danes to this day consider him their reformer. In 1542, he returned to Wittenberg, and continued his energetic efforts to extend the new theology throughout his native land. He died 20th April, 1558. His best work is his *Interpretatio in Librum Psalmorum* (Nürnberg, 1523).

BUGHIS, or Bugis, a Malay people in the island of Celebes. The merchants of these people do much of the trade of the island and the neighboring seas. Their government is an elective monarchy, the chief ruler being chosen by the nobles and the higher classes. He holds power only during good behavior, and may at any time be voted out of office. The people are represented as being orderly, peaceable, and well behaved; good good workers in iron, copper, cotton, etc.; constructing good houses and durable ships. Their language has been reduced to writing, and they use the common divisions of the year. They also use the magnetic compass and charts. Half a century ago they were represented as cannibals, but they were conquered by the Macassars and compelled to embrace Mohammedanism. In recent years they have settled colonies of their own people in some of the adjacent countries.

BUGLE, *Ajuga,* a genus of plants of the natural order *labiatæ,* having an irregular corolla, with very short upper lip and trifid lower lip, the stamens protruding. The species are mostly natives of the colder parts of the old world, and several are British. The common B. (*A reptans*) is abundant in moist pastures and woods. Its flowers are generally blue, but varieties occur with white and purplish flowers, which are often introduced into flower-borders. The Alpine A (*A. Alpina*) is one of the beautiful flowers of the Swiss Alps.

BU'GLOSS, a name popularly applied to many plants of the natural order *borragineæ* (q.v.), as to the species of *anchusa* or alkanet (q.v.), etc. In some botanical works it is confined to the genus *lycopsis,* a genus differing from *anchusa* in little but the curiously curved tube of the corolla, and of which one species, *L. arvensis,* is a common weed in cornfields in Britain. The beautiful genus *echium* bears the English name of Viper's Bugloss.

BUHLE, Johann Gottlieb, 1763–1821; a German scholar and historian of philosophy; a graduate of Göttingen; at an early age occupied a professor's chair at Brunswick. Thence he went to Moscow as professor of ancient languages, and on his return to Brunswick took the chair of natural law, which he held during his life. He edited *Aratus,* and a part of *Aristotle,* and wrote a hand-book of history and philosophy, and a useful history of modern philosophy.

BUHL-WORK, or Bool-work, is the name applied to a sort of inlaying of brass scrolls and other ornamental patterns in wood. The name is derived from its inventor, Boule, an Italian cabinet-maker, who settled in France in the reign of Louis XIV. He employed veneers of dark-colored tortoise-shell, inlaid with brass. Cabinets of his manufacture are highly prized, as are also those of his contemporary Reisner, a German, who used a ground of tulip-wood, inlaid with flowers, etc., in darker woods, and varied with margins and bands of light wood, with the grain crossed for contrast. This modification of buhl-work is correctly called Reisner work. For details of the methods of working, see Inlaying and Mosaic.

BUHREACH', or Bharaich, a t. of Oude, India, the principal place of a district of the same name. It is in n. lat. 27° 34′, e. long. 81° 33′—65 m. n.e. of Lucknow. It is an old town, of considerable size, situated in a pleasant wooded plain, on the left bank of the Sarju. The houses are mostly built of mud and covered with thatch; but the mausoleums, mosques, and residences of merchants are of brick and lime-mortar. North-east of the town is the tomb of Selar, a reputed Mussulman saint, to which there is a great concourse of pilgrims annually in the month of May. Pop. '71, 18,889; of district, 774,640.

BUHRSTONE, a variety of quartz (q.v.), containing many small empty cells, which give it a peculiar roughness of surface, particularly adapting it for millstones. The name is given without reference to geological relations, but it is *vein quartz,* rather than true *quartz rock,* which ordinarily assumes the character of buhrstone. There are different varieties of B., some of which are more compact, or have smaller cells than others; and those in which the cells are small and very regularly distributed, about equal in diameter

to the spaces between them, the stone being also as hard as rock-crystal, are most esteemed. Good B. is found at Conway in Wales, and at several places in Scotland; but the finest millstones are obtained from the quarries of La Ferté-sous-Jouarre, in the department of Seine-et-Marne, near Paris. A single millstone in one piece of 6 ft. diameter, sells for about £50, and one formed of several pieces for about £33. It is not unusual to form millstones of pieces of B. cut into parallelopipeds, like great wedges of soap, and bound together by iron hoops. The stone is found in beds or in detached masses, and the mode of quarrying is peculiar. When the mass is large, it is cut out into the form of a huge cylinder; around this, grooves are cut, at distances of about 18 in., the intended thickness of the millstones; into these grooves wooden wedges are driven, and water is thrown upon the wedges, which, causing the wood to swell, splits the cylinder into the slices required.—Millstones are not always made of B., but sometimes of silicious gritstones, of sandstone, and even of granite. B. millstones are extremely durable.

BUIL, Bernardo, d. 1520; a Spanish Benedictine monk, in 1493 sent by the pope as apostolic vicar to the new world, accompanying Columbus on his second voyage. In 1495, he returned to Spain, and was one of the foremost in pressing charges against the unfortunate discoverer.

BUILDING, the art of erecting or building houses and other edifices, in which several distinct professions are usually and more immediately concerned. At the head of the building-trade is the architect, who is employed to draw plans and make out specifications of the work to be performed. The builder acts ministerially; his duty consists in carrying out the plans put into his hands, according to certain stipulated terms. The profession of the architect demands not only much imaginative power, but great artistic skill, along with a practical knowledge of details. Endeavoring to realize the wishes of his employer, the architect devises what shall be the external effect and interior accommodation of a building, and portrays the whole on paper with rigorous accuracy. Besides general designs to give an idea of the structure and its interior arrangements, he furnishes the working-plans or drawings, which are to guide the different mechanics—masons, joiners, etc.—in their several operations. These services of the architect, of course, involve much thought and labor, and he is therefore under the necessity of employing a staff of assistants, by whom the plans are executed under his orders. The making out of the specifications is a matter of careful study. To perform this part of his duty properly, the architect needs to be acquainted with the qualities of different kinds of materials; such as stone, lime, sand, bricks, wood, iron, etc. A knowledge of the strength of timber is particularly desirable. When the specifications are made out, they and the contract are subscribed by the builder. To insure as far as possible a faithful adherence to the specifications, the architect appoints a "clerk of works" to keep watch over the whole operations, and who is authorized to check any seeming fault. During the whole proceedings, the architect is paramount. For the due execution of his plans, he feels that his professional reputation is at stake; and, accordingly, having involved his responsibility, the employer cannot with propriety interfere to make alterations while the work is in progress. Such is the etiquette of the profession. Should alterations be desirable, they become matter for a fresh agreement among the parties. When the works are finished, the builder hands his account to the architect to be examined and checked. If satisfied of its correctness, he grants a certificate of the fact, and this is the warrant for payment by the employer. The builder having been settled with, the employer now pays the architect's fee, which closes the transaction. This fee may be one, two, or more per cent on the entire cost of the B., according to local usage or terms agreed on; whatever it is, it covers all charges for advice, plans, and other professional trouble.

Builders undertake work by "contract," or by "schedule of prices." If by contract, they engage to execute the whole works for a stipulated sum. If by schedule of prices, they agree to abide by the measurements of valuators appointed by the architect. These valuators go over the works when finished, and, taking an exact account of everything, compare it with the account rendered by the builder; the architect being the ultimate referee. It is exceedingly important, for the sake of an amicable adjustment of accounts, that the builder should adhere scrupulously to the letter of the specifications—i.e., the covenant under which he has become bound. He can justify no departure from the specifications, on the plea that something as good has been given or done, or that he was not checked at the time by the clerk of works. Being explicitly a person employed to do a certain piece of work, in a certain way, he is in no respect entitled to substitute his own notions for those of his employers.

It may happen that a proprietor acts as his own architect, and employs a builder to execute his designs, on the understanding that he is to pay for everything according to a schedule of prices. In many instances, the builder is proprietor as well as architect, and merely carries out his own plans. Such is generally the case in the neighborhood of London, where builders speculate in leasing land and erecting rows of dwellings for sale. This plan is greatly facilitated by the opportunity of buying every article required in house-building ready for use, such as bricks, door-steps, hearthstones, joists, flooring, doors, windows, marble mantel-pieces, slates, etc. In fact, house-building in the metropolitan district is very much reduced to a system of purchasing and putting together

certain articles from manufactories and depots. For this kind of business, there may be said to be establishments for the sale of doors and windows, as there are shops for the sale of nails, locks, and hinges.

The application of a comprehensive manufacturing system in the preparation of various parts of a building is observable most particularly in certain establishments of great magnitude. The test is this—whether the builder conducts so gigantic a trade as to warrant him in setting up a steam-engine of great power, and in providing highly wrought machines for cutting and otherwise treating wood, stone, etc. When once this degree of magnitude is reached, the operations are conducted under very great advantage. The Crystal palace in Hyde park could never have been built at the stipulated cost, nor in the required space of time, but by the application of steam power to work the machines which shaped and grooved the *two hundred miles* of sash bars; by the resources of the largest English establishment in the glass-trade, in making 1,000,000 sq. ft. of sheet-glass; and by the skill and capital of our great iron manufacturers, in rapidly producing 3000 iron columns, and more than that number of iron girders. When the late Mr. Thomas Cubitt was engaged in the vast building operations at Belgravia (a district in the w. of London owned by the marquis of Westminster), his factory on the banks of the Thames was the most complete ever known in the trade. It exemplified both the principles adverted to above—the manufacture of various articles by steam-worked machinery; and the collecting of large stores of other articles made in a similar way by other firms. There was a store of drawing-room and parlor doors, a store of window-sashes, a store of street-doors, and stores of mantel-pieces, stone and marble steps, balusters, slates, knockers, bells, and all the materials for house-building from the coarsest to the finest. There was also observed that systematic gradation of kinds and dimensions which is so much attended to in the higher kinds of machinery, and which so much expedites all operations; seeing that one particular piece would not only fit into or against another, but into or against any one of a whole class to which that other belonged. A house built in this systematic way partakes a good deal in the nature of a large machine, in which all the parts fit together with very great accuracy. There can be little doubt that if skill and capital be judiciously applied in this way, a house ought to be better built and to cost less than if built in the ordinary unsystematic manner. It may also be mentioned here that Mr. Cubitt was the owner of a very large brick-making establishment on the banks of the Medway, between Rochester and Maidstone, where steam-power was employed in all the operations of making bricks. Some of the great railway contractors, who have become millionaires, were originally house-builders, alive to the grand results producible by the combination of steam-worked machinery with the labor of well-organized bodies of men.

As an art, B. is of vast antiquity, and has assumed different forms, according to the necessities of mankind and the materials readily at their disposal. In ancient Egypt, Greece, and Italy, B. in stone rose to a high state of perfection, and till the present day it may be said that the greatest progress in the art is made only where stone of a manageable kind is conveniently at command. Rome, Paris, Lyons (with very many Italian and French cities), Bordeaux, Brussels, Munich, Geneva, Vienna, Edinburgh, and Glasgow are specimens of what may be achieved in stone workable with the chisel; Aberdeen is mainly built of granite. On the other hand, London, the greatest city within the bounds of civilization, is built of brick; so likewise are Manchester and Liverpool; also Amsterdam, Rotterdam, and other towns in Holland; and as a general fact, it would appear that wherever brick has to be resorted to, there the allied arts of architecture and building, as regards domestic accommodation and elegance of style, are on a poor scale. B. with stone of a superior kind is now becoming common in New York, Philadelphia, and some other American cities. It is not necessary to trace in this article the various processes embraced in the comprehensive term BUILDING; seeing that all the materials used, and all the operations conducted, are noticed under the proper headings in the encyclopædia.

BUILDING ACT FOR LONDON AND ITS NEIGHBORHOOD. See METROPOLIS LOCAL MANAGEMENT ACT.

***BUILDING LEASES.** In the law of England, a building lease is a demise of land for a long term of years, the lessee covenanting to erect certain houses or edifices thereon, according to specification. By the 19 and 20 Vict. c. 120, amended by the 21 and 22 Vict. c. 77, and which acts also apply to Ireland, the court of chancery is empowered to authorize leases of settled estates and B. L., which shall take effect in possession within one year next after the making of the same; the term for such building lease being 99 years; or where the court shall be satisfied that it is the usual custom of the district, and beneficial to the inheritance to grant B. L., for longer terms, then for such term as the court shall direct. By a subsequent enactment, it is declared that the term building lease shall include a repairing lease, but such repairing lease to be for a term not exceeding 60 years.

By the 5 and 6 Vict. c. 108—passed to enable ecclesiastical persons to grant long leases for building, repairs, or other improvements—it is enacted that any ecclesiastical corporations, aggregate or sole, excepting as mentioned in the act, may, with consent of the *ecclesiastical commissioners for England* (q.v.)—to which, where the lessor is

incumbent of a benefice, the consent of the patron also must be added—demise by deed the corporate lands or houses for any term not exceeding 99 years, to take effect in possession and not in reversion, to any person willing to improve or repair the same; provided that on the grant of such leases, a small rent may be reserved during the six first years, with an increased rent afterwards; but no such lease is to comprise the usual house of residence, its out-buildings, or pleasure-grounds. The act contains other regulations, and it declares generally that it is made without prejudice to any right that ecclesiastical persons have under the former law to grant or lease, whether by renewal or otherwise.

In the Scotch law, the term building lease is applied to the case of proprietors of entailed estates, who, in order to encourage the building of villages and houses upon property so settled, are to have it in their power to grant leases of land for the purpose of building, for any number of years not exceeding 99 years. See this matter regulated by the 10 Geo. III. c. 51. By the 3 and 4 Vict. c. 48, proprietors of entailed estates in Scotland may feu or lease on long leases ground for the building of churches and schools, and for the dwelling-houses and gardens for the ministers and masters of the same, and also for burying-ground and play-ground attached to such churches and schools. See LEASE, LEASEHOLD, and GROUND-RENT. See *Supp.*, page 882.

BUILDING SOCIETIES. See BENEFIT SOCIETIES, *ante;* CO-OPERATION.

BUILDING STONE. The chemical composition of B. S. varies. The majority of kinds are more or less silicious, and are designated sandstones. These consist of particles of sand, united together by the force of cohesion, and by a small proportion of a natural cement; in some cases, ferruginous, consisting of a compound of iron; and in other instances, calcareous, composed of carbonate of lime. Igneous rocks furnish very durable B. S., though in general the hardness of the materials renders them so difficult to work, that they are seldom resorted to where softer stones can be procured. Thus, granite is largely employed in the construction of the houses in Aberdeen, in the erection of bridges, in the paving of streets, and wherever great durability is required. Greenstone and basalt are also occasionally used. The B. S. employed in the new houses of parliament is a magnesian limestone, or a double carbonate of lime and magnesia, which is very close and compact in texture, and is soft enough to be easily cut with the chisel; unhappily it has not proved firm enough to resist weathering, having already shown signs of decay. The other forms of carbonate of lime exhibit considerable durability. Near Bath and in the isle of Portland, an oolitic limestone is quarried, which is easily cut, and stands well.

A very convenient and accurate way of determining the durability of a B. S.—in other words, its power of resisting the effects of frost and other atmospheric agencies—is to place a small block in a cold saturated solution of sulphate of soda; raise to the boiling-point, so as to expel air from cavities in the stone, which then become filled with the solution; then allow to cool, and suspend the block of B. S. in air. Every now and then, it is dipped into the solution, and subsequently air-dried. The result is, that the sulphate of soda crystallizes on the outside and partially in the interior of the block, and in this respect acts as water does when it is frozen during winter; and if the B. S. be porous, and liable to decay by natural agencies, it gradually breaks up, and particles scale off. The amount of this corrosion can be determined by weighing the detached portions. Some building stones contain iron pyrites in little nodules diffused here and there throughout the mass, and such become discolored from the pyrites being decomposed by atmospheric influence, and the brownish-red oxide of iron (rust) is left as a stain on the surface of the block. The liability to decay or to discoloration in a B. S. may be arrested to a great extent by coating the outer surface with boiled linseed-oil, which communicates a dark appearance to the stone, but prevents oxygen or moisture from gaining access to the block. Ordinary oil paint is employed for the same purpose. For the preservation of B. S. from decay by means of various solutions, see STONE, PRESERVATION OF: STONE, BUILDING.

BUITENZORG, a t. in Java, 66 m. s. of Batavia, with which it has railway communication. It is in a fine situation, 800 ft. above the sea, and is a favorite residence for Batavia's rich men. The country palace of the governor-general is one of the chief buildings, and there are a mansion for the regent, a garrison church, and mosques. The botanical gardens, laid out in 1817, are among the best in the world. In the neighborhood is a sacred forest held in great veneration by the natives.

BUJALANCE, a city of Andalusia, Spain, about 20 m. e. of Cordova. It is surrounded by a moat and a wall flanked with old towers, has an old Arab castle, and manufactures of woolens, glass, and pottery, exports of agricultural produce, and an important annual cattle-fair. Pop. about 9000.

BUKKUM WOOD. See BRAZIL WOOD and SAPPAN WOOD.

BUK'KUR, a fortified island of the Indus, in Sinde, in lat. 27° 39′ n., and long. 68° 56′ e. It is 400 yards from Roree, on the left bank, and 100 from Sukkur on the right. In the ordinary state of low water, the western and eastern arms of the river are respectively 15 ft. and 30 ft. deep. In particularly dry seasons, however, the former has been known to disappear altogether, and even the latter is said to have occasionally been

fordable. In 1839, a British force, on its march to Afghanistan, made a stepping-stone, as it were, of B. in crossing the Indus, having joined it to either mainland by a bridge of boats. B. is no longer of any military value against a civilized assailant, commanded, as it is, on both sides by higher grounds. It is composed of limestone, being 800 yards long, and 300 broad, and rising 30 ft. from the average level of the stream.

BUK'KUR, a t. of Sinde, about 3 m. e. from the Indus, on a water-course derived from the great river, and flowing parallel with it, 190 m. w. of Lahore. It is situated in a fertile district, and carries on an active commerce. Pop. 8000.

BUKOWI'NA, a duchy in the Cis-Leithan (non-Hungarian) section of the Austrian empire, on the Russian frontier; area, 4000 sq.m.; pop. '80, 571,671. (of whom 41 per cent are Ruthenian Slavs and 38 are Moldavians). It is traversed by offsets of the Carpathians, gives rises to many rivers, and abounds in wood, along with considerable mineral riches. Wood-cutting and mining afford occupation for a great number of the inhabitants. Large numbers of cattle are reared, and also excellent horses. B., till the end of the 15th c., belonged to Transylvania, when it came under the dominion of the Turks, by whom it was ceded to Austria in 1777. Czernowitz is the chief town.

BULACAN', a t. of Luzon, Philippines, at the head of the bay of Manila, about 20 m. n.w. of the city of that name. B. is chiefly composed of wooden houses, but has spacious streets, manufactures of silken mats and other fabrics, and large sugar-boiling establishments. Pop. between 9000 and 10,000.

BULAMA, the most easterly of the Bissagos islands off the w. coast of Africa; 11° 34′ n., 15° 33′ w.; 18 by 9 m.; fertile and heavy wooded, but insalubrious. There is a good harbor. An English colony was sent here in 1792, but nearly all soon fell victims to the climate.

BULAU, or TIKUS, *Gymnura rafflesii,* vig., an animal in Sumatra, of the mole family resembling the opossum. The body is 12 to 14 in. and the tail 9 or 10 in. long. It is about 5 in. high at the shoulder; color black and white, with a black stripe over each eye; the fur mixed with long bristly hairs, and tail nearly naked. It feeds on insects, and secretes a strong odor of musk.

BULB, in botany, a subterranean bud covered with imbricated scales, having at their base a flattened disk, which represents the proper stem of the plant, and from which the roots proceed downwards, whilst from the midst of the scales an annual herbaceous stem and leaves are sent up. The scales are regarded as modified leaves, and sometimes are all fleshy, as in the lily; sometimes the outer ones are membranous, as in the onion, in which case the B. is said to be *tunicated.* The B. is popularly but erroneously regarded as the root or part of the root of the plant, and plants in which it is found are very generally described as *bulbous-rooted.* New buds are formed in the axils of its scales, which grow at the expense of the parent B., and gradually destroy it. In some plants, as the tiger-lily and some species of allium, leaf-buds (*bulbils* or *bulblets*) are developed on the stem above-ground, which spontaneously separate and serve for the propagation of the plant, and which are entirely of the nature of bulbs, being formed of thickened scales, sometimes so closely united as to form a solid mass. The CORM (q.v.) was formerly regarded as a kind of B., and described as a solid B., but its structure is essentially different, although both it and the TUBER (q.v.) may be included in the description which Linnæus has given of the B. with reference to the purpose which it serves as "the winter-quarters of the plant." Many bulbs, if removed from the ground during the period when the vegetation of the plant is most dormant, may be kept in a dry place without injury for a considerable time, even for years. Bulbs serve also for the preservation of plants in periods of drought, and are particularly frequent in those which delight in sandy soils. The abundance of "bulbous-rooted" plants is a remarkable characteristic of the flora of the cape of Good Hope. "Bulbous-rooted" plants are very often distinguished by the beauty of their flowers, and many of them are among the most esteemed ornaments of gardens, greenhouses, and stoves. The bulbs of tulips, hyacinths, and other favorite flowers are important articles of trade. Some bulbs, as that of the onion, are valuable as articles of food; others, as that of the squill, from their medicinal properties.

BUL'BUL, an Armenian name for the nightingale, which has found its way into English poetry chiefly through the patronage of lord Byron. But the same name is given in India to a very different bird, *pycnonotus hæmorrhous,* belonging to the great tribe of *dentirostres,* and formerly ranked among the thrushes, to which it is pretty nearly allied. It is a little bird of brilliant plumage, and the male has a crest or tuft on its head. It is remarkable for its pugnacity; the Singhalese consider it the most *game* of all birds.

BULGA'RIA, an autonomous principality, tributary to Turkey, which till 1878 constituted the Turkish vilayet of the Danube (Tuna). B. is bounded to the n. by the Danube and the Dobrudscha, now Roumanian; on the e. it has the Black sea; on the s. the Balkan range; and on the w., Servia and Roumelia. There are altogether between 2,000,000 and 3,000,000 of the Bulgarian race; of the 2,000,000 souls who form the population of the new state of B., the great majority are Bulgarians. The area of B. is about 33,000

sq. miles. The country slopes terrace-like from s. to n., and from the w. to the e., acquiring a plain-like character before reaching the Black sea. The rivers are rapid and tributary to the Danube. The soil in some parts is very fertile, producing great abundance of corn; in others, it does not yield sufficient for the consumption. There is excellent pasture-land, and the lower terraces are richly wooded. The exports include horned cattle, sheep, corn, wine, iron, wood, honey, wax; and otto of roses is an important article. The inhabitants are hard-working, hospitable, and fairly intelligent, but suspicious and greedy; their faith is that of the Greek church. The prince, freely elected by the people, must be confirmed by the porte with the assent of the powers. The first choice of the Bulgarians was the prince of Battenberg, a cousin of the grand-duke of Hesse, who in 1879 became Alexander I. of Bulgaria. The government is Christian, and there is a national militia. The Berlin congress decided that the military importance of B. should meanwhile be decreased by the demolition of all its fortresses.

The earliest known inhabitants of B. were the Mœsians, who contended long against the Romans, and allied themselves with Gothic and Slavonic tribes against the Greek empire. Anastasius, the Greek emperor, in 507, built an extensive wall to defend his territories from Mœsian invaders. In the 7th c., the Bulgarians, a people of Finnish origin, whose original seat was the banks of the Volga, conquered the Mœsians, and established the kingdom of Bulgaria; they soon lost their own language and customs, and became assimilated to the other Slavonic inhabitants. After being tributary to the Greek emperors, and contending for some time against Hungary, B. became subject to the Porte in 1392; but the frightful oppression of despotic and sanguinary pashas has not, even to the present day, robbed the inhabitants of a distinctively national life and love of freedom. In April, 1876, an insurrection broke prematurely out in B., and was quenched in blood, the bashi-bazouks or Turkish irregulars committing savage excesses. The atrocities in B., taken in connection with the Servian war and the condition of other Christian provinces of Turkey, led to diplomatic intervention; and in December a conference met at Constantinople, but without result. The war of 1877–78, between Russia and Turkey, followed, The congress of Berlin, which revised the treaty of San Stefano, declined to sanction the erection of a Bulgarian principality extending from the Danube to the Ægean. But it constituted an autonomous, though tributary, Bulgaria n. of the Balkans, and to the mainly Bulgarian province s. of them, that of eastern Roumelia (q.v.), it granted administrative autonomy.

The Bulgarian Language is divided into two dialects—Old Bulgarian and New Bulgarian; the former, the richest of the Slavonic dialects; the latter remarkable for its store of popular songs.

BULGARIAN LANGUAGE, the richest of the old Slavic tongues, used by the Græco-Slavic church, and the chief medium of religious writings in that region. After the fall of the Bulgarian kingdom, about 1400 A.D., the language became mixed with neighboring dialects and lost its purity. In the older literature are found translations of the Bible made in the 10th century. The literature of the present time is of small account, being only such as is found in elementary and doctrinal works. Grammars and dictionaries have been published since 1835, and a New Testament was issued in 1840 for the British and foreign Bible society. The language lives in many native songs, but is not as yet printed anywhere in the country.

BULGARIN, Thaddeus, a Russian author, was b. in Lithuania, 1789; fought in the campaign against France, but afterwards served under Napoleon. On Napoleon's fall, he devoted himself to literature. He wrote both in Polish and Russian; and ultimately settling in St. Petersburg, became a popular author. He composed several romances—of which *Demetrius* and *Mazeppa* are the best—and published different periodicals. His large work, *Russia in its Historical, Statistical, Geographical, and Literary Aspect,* was published at Riga, 1839–41. He died in 1859.

BULGARIS, Dimitri. See page 882.

BULGARUS, the most celebrated of the famous "four doctors" of the law school of Bologna. He was a native of that city, and was regarded as the Chrysostom of the gloss writers. He lived to a great age, becoming childish before his death in 1166. B. was one of the most trusted advisers of the emperor Frederick I. The commentary *De Regulis Juris* is his most celebrated work.

BULI'MUS, a genus of land snails most numerous in the moist parts of Brazil. *Bulimus ovatus,* sometimes 6 in. long, is sold in the Rio Janeiro markets. It has an oblong turreted shell of unequal margin, and lays large eggs nearly an inch long, resembling those of birds, but very brittle, which it protects by a covering of dried leaves. There are many fossil species. The species of temperate regions are small.

BULKHEADS, in a ship, are the partitions between the several portions of the interior; whether to separate it into rooms, or as a safeguard in case of wreck.

Water-tight B. are among the improvements in modern ship-building; they are iron walls running athwart the hold, as a means of dividing it into several portions; the interior is thus cut off into cells, each water-tight in reference to its neighbors. When such a ship is leaking in any one of the compartments, there is thus a chance that the others may be kept dry until the damage is repaired. In iron steamships the water-tight B. are generally placed transversely, but there are frequently longitudinal water-

tight divisions also. The number and disposition of the compartments depends on the ship-owner and the ship-builder; but it is now the common practice to place the engines and boilers in water-tight sections, and experience has proved the special value of a collision-bulkhead in the bow. In iron-clads of the navy, such as the *Hercules* and the *Bellerophon*, which have an inner bottom, there are nine transverse water-tight bulkheads. In the torpedo-ram *Polyphemus*, the principle of having numerous water-tight compartments in the lower part of the vessel has been carried as far as possible.

BULKLEY, Peter, 1583–1659; b. England; the earliest minister in Concord, Mass. He was his father's successor at Woodhull, England, but was removed for non-conformity, and in 1635, with a number of other emigrants, founded the Concord settlement. He wrote several Latin poems, and a work called *The Gospel Covenant Opened*, published in England. His son Edward succeeded him in the ministry.

BULL (Lat. *bulla*, primarily, anything round or swelling) was originally the name of the capsule of the seal appended to letters from emperors or from the pope. Afterwards, the word was applied to the seal, and next to the document itself, as in the case of the celebrated golden bull of the emperor Charles IV., which was so named from the golden capsule appended to imperial letters and other important documents by the Byzantine and Frank emperors as early as the 9th century. They are issued by the apostolic chancellor, and are dated "from the day of incarnation," whereas briefs are always dated "from the day of the nativity." The name is now applied exclusively to letters or documents issued in the name of the pope. In cases of granting favors, etc., the seal is appended to the open letter by a yellow or red band of silk; but in the administration of justice, a gray hempen band is used. All bulls, excepting those addressed to the united Greek Christians, are written in Latin with Gothic letters, and on the rough side of the parchment. See Brief. All bear the name and title of the pope—for example, *Gregorius Episcopus Servus Servorum Dei*, etc., is prefixed; then follows a general introduction, of which the initial words are used to give a distinct name to the B., as in the examples: the B. *Exsurge Domine*, issued by pope Leo X. against Luther in 1520; the B. *In Cœna Domini*, the celebrated B. against heretics, often reissued since 1536; the famous *Unigenitus*, or B. against Quesnel's writings, 1713; the *Dominus ac Redemptor Noster*, or B. for the abolition of the order of Jesuits; the *Ecclesia Christi*, or the B. which completed the *concordat* with France in 1801; the *De Salute Animarum*, or the B. for the regulation of the Catholic church in Prussia. To every B., the leaden seal of the church is appended, bearing on the obverse the arms of the pope, and on the reverse his name. Bulls issued during the interim between the election and consecration of a pope have no armorial bearings on the seal. A *bullarium* is a collection of papal bulls, as the *Bullarium Magnum Romanum a Leone Magno ad Benedictum XIII.* (19 vols., Luxembourg, 1727–58), the *B. Romanum* (28 vols., Rome, 1737–44), and the *B. Benedicti XIV.* (Mechlin, 1826–27), and more recently, the continuation of the *Bullarium Romanum Magnum* by Barberini (Vienna, 1835).—From the same mediæval Latin word *bulla* is derived the word *bulletin* (Ital. *bulletino*), commonly applied to dispatches from generals, reports of the health of royal personages, and on the continent, at least, to other brief authenticated documents, such as those of scientific societies, the best known of which are the bulletins of the St. Petersburg and Belgic academies. It is, moreover, used as a title for periodicals, and, in France, also designates the slips of paper on which electors write their votes.

BULL. See Ox, *ante*.

BULL, George, d.d., a learned prelate and theological writer, b. at Wells, Gloucestershire, England, Mar. 25, 1634; studied at Oxford, whence he retired in 1649, having refused to take the commonwealth oath imposed by the parliament. Receiving holy orders, his first charge was the parish of St. George's, Bristol. In 1658, he obtained the rectory of Suddington St. Mary's, near that city; and in 1662, was presented to the vicarage of Suddington St. Peter's. In 1669, he published his *Harmonia Apostolica*, the object of which was to reconcile the apostles Paul and James on the subject of justification. This work occasioned considerable controversy among divines, and in answer, B. published his *Examen Censuræ*, and *Apologia pro Harmonia*. In 1678, he was presented to a prebend in Gloucester cathedral, and made rector of Avening, Gloucestershire. In 1679, he was installed archdeacon of Llandaff, and received the degree of d.d. from Oxford University. In 1685, he published his *Defensio Fidei Nicenæ*, against the Arians and Socinians, Tritheists and Sabellians; and in 1694, his *Judicium Ecclesiæ Catholicæ*, for which the thanks of the whole French clergy were sent to him through the celebrated Bossuet. His last work was his *Primitive and Apostolical Tradition*, etc. He was consecrated bishop of St. Davids in 1705, and died Feb. 17, 1709.

BULL, John, 1563–1628; an English organist and composer. He was appointed organist in the queen's chapel in 1591, and next year made doctor of music in Gresham college. Not understanding Latin, he was especially permitted to lecture in English. He visited the continent, and had many offers of honorable and lucrative positions, but declined all, returning to England to be organist to James I. On another visit to the continent he became organist to the cathedral in Antwerp, where he died. The claim that he composed the English national anthem has not been sustained.

BULL, John, a familiar synonym for the English people. Its origin is attributed to dean Swift, but Arbuthnot first gave it literary currency in his *History of John Bull* (1712), a political allegory intended to satirize the duke of Marlborough, and to increase feeling against the war with France. In art John Bull is well known as a burly country squire, impetuous, honest, narrow-minded, dogmatic, and easily imposed upon.

BULL, Ole Bornemann, a famous violinist, was b. 5th Feb., 1810, at Bergen, in Norway. His father, it is said, attempted to coerce him into the study of theology, and would not permit a musical instrument about the house. This foolish treatment only gave a more decisive character to the peculiar genius of the boy. At the age of 18 he was placed at the university of Christiania, from which he is said to have been expelled for taking temporary charge of the orchestra at one of the theaters. In 1829, he went to Cassel, in Germany, to study under Spohr, but was so coldly received that he betook himself to the study of law at Göttingen. He was subsequently at Minden, whence, in consequence of a duel, he fled to Paris in 1831. An unsuccessful attempt to drown himself in the Seine was the turning-point in his life. He thereafter acquired the patronage of a lady of rank, and rapidly rose to fame as a violinist. His style of playing was like that of Paganini. B., however, wished to excel his model in originality, and in triumphing over the most extraordinary difficulties; but it was impossible for him to follow the flight of the great Italian, in whose brain some capricious musical demon seemed to lurk. Nevertheless, he was received in Italy with prodigious enthusiasm—Malibran herself embracing him on the stage at Naples. In 1836, he visited England, Scotland, and Ireland, and subsequently traveled in a professional capacity through Belgium, Holland, Russia, and Germany. After a long repose, he sailed for America, whence he returned in 1850; but he again went out, and was so successful, that he thought of retiring from public life. He purchased in Pennsylvania 125,000 acres of excellent ground, and founded a colony of Scandinavians. This turned out a complete failure, and B. was again compelled to resume his violin. He visited Europe, returning with a fortune to the United States in 1869; he revisited Europe in 1875 and 1879.

BULL, Ole Bornemann (*ante*), d. 1880; came to New York the first time in 1843. He became attached to this country, taking a great interest in its republican form of government. Returning to Norway, his American ideas offended the government, resulting in many lawsuits and the dissipation of his wealth. His wife, a Parisian lady, died; and in 1852, after an absence of 7 years, he came again to this country. Here he put into practice a scheme long contemplated, which, like most of his business speculations, resulted disastrously. He purchased 120,000 acres of land in Pennsylvania, and attempted to found there a colony of his countrymen. He designed a castle for his permanent home, and erected it on the summit of a mountain, from which there was a commanding view. Before the castle was completed the colonists grew discontented, and about the same time he learned that the title to the land which he had purchased was worthless. Ole Bull relinquished everything, and again had recourse to his violin to repair his bankrupt fortunes. All that remains as a reminder of his grand scheme is the village of Oleana, named after him, which clusters around the base of the mountain capped by the once lordly castle known to this day as "Ole Bull's Folly." After a profitable European tour, he returned to this country, and has made his home since 1869 in Cambridge, Mass. In 1870, he made a happy marriage with a young Wisconsin lady. His form was tall and erect even to old age. He was gifted with a remarkable memory and with social qualities by which he made and retained many friends. On his seventieth birthday, which occurred in Feb., 1880, a surprise party was given in his honor at his home in Cambridge, at which many literary celebrities of the vicinity were present. He was then, to all appearances, strong and healthy. Early in the summer he sailed for his summer residence in Norway, where he died.

BULLA, a genus of mollusca, which in the older systems, founded upon characters taken from the shell alone, contained a heterogeneous assemblage of species essentially very different. Some of those having been removed to other orders, according to their organization, the genus *bulla*, and the family *bullidæ*, of which it is the type, are placed in the order *tectibranchiata* of Cuvier, an order of the class *gasteropoda* (q.v.), and of that section of it called *monœcia*, having the male and female organs of sex combined in the same individual. The *bullidæ* have a convoluted and generally thin shell, which serves as a covering and protection for the gills, and which in some of them is large enough to form a retreat for the entire animal, in others is itself enveloped in the mantle. This shell forms a sort of transition link between the flat calcareous plate inclosed in the mantles of the *aplysiæ* or sea-hares—to which B. is nearly allied—and the spiral shell of snails and other such conchiferous mollusks. The mouth of the shell is large, extending the whole length of the shell, widening towards one end, the lip acute. The gizzard of the *bullidæ* is very muscular; and among its thick coats, in many species, are found calcareous bony plates, which being moved against each other by its muscles, serve to grind down the food. All the species are marine, some are found on the British coast. Some, from their form and fragility, are popularly called Bubble Shells, as the British *bulla hydatis*.

BULLACE, *Prunus insititia*, a shrub or small tree, larger and much less spiny than the sloe, but very closely allied to it, as it is also to the plum, so that many botanists

regard them all as one species, an opinion much confirmed by the circumstance that the varieties pass into each other by imperceptible gradations. The B. may be regarded as a form intermediate between the plum and the sloe. Its leaves, however, are generally broader in proportion to their length than those of either of these, and its fruit-stalks more frequently in pairs; it differs also from both of them in its downy fruit-stalks, and in having the under side of its leaves permanently downy. The flowers are rather larger than even those of the plum; the fruit is larger than the sloe, generally globose, and, although it partakes in some degree both of the acidity and the roughness of the sloe, it is not unpleasant, especially after having been mellowed by frosts, and makes excellent pies or tarts. "A bullace-pie is a standing dish at the harvest-home supper in the south of England, only it requires rather more sugar than the housewife is always willing to allow." The B. is common in hedges, coppices, and banks in England, and in many parts of Europe. It is rare in Scotland.

BULLÆ are collections of serous fluids of considerable size, situated immediately beneath the cuticle, and rising from the true skin. They differ from vesicles only in size; and no very definite line can be drawn between a large vesicle and a small bulla. They usually vary in diameter from a quarter of an inch to two inches. They may be followed by crusts or by ulcerations. They constitute a special order of skin-diseases, which includes pemphigus and rupia (q.v.).

BULLAS, a t. of Spain, in the province of Murcia, and 26 m. w.n.w. of the town of Murcia. It is situated on a hill, 1840 ft. above the sea. The streets are steep and unpaved. B. has manufactures of linen and hempen fabrics, earthenware, and brandy, and a considerable trade in manufactured goods and grain. Pop. 5145.

BULL-BAITING, a barbarous sport, once very popular in England, and in which all classes of society equally delighted, but now, through the progress of civilization, almost entirely confined to the lowest, and rare even among them. It consists in causing a bull to be attacked by dogs; and, in order that the bull might be made as furious as possible, his nose was sometimes blown full of beaten pepper before he was turned loose. Another form of this sport was to fasten the bull to a stake, by a rope of some yards long, and to send bull-dogs against him, one at a time, which were trained to seize him by the nose, and, when this was accomplished, it was called *pinning* the bull. But no small part of the enjoyment of the spectators was derived from the success with which the attacks of the dogs were met by the bull lowering his head to the ground, and receiving them on his horns, often tossing them to a great distance. In some places, bull-baiting took place regularly as a sort of annual festival, and funds were sometimes left to provide for it. King James I. of England greatly delighted in this sport. When the late emperor Nicholas of Russia visited England, before his accession to the empire, he was present at a boxing-match and a bull-baiting, which were got up to show him English tastes.

An equally barbarous sport, termed *bull-running*, was formerly practiced at Stamford and Tutbury, where men and women took the place of dogs, maddened the bull with hideous noise, and then pursued it with "bull-clubs," till the unfortunate animal expired beneath the blows of its brutal assailants.

BULL-DOG, a kind of dog which is regarded as peculiarly English, but concerning which it is doubted whether it has existed as a distinct race, at least from the Roman era, or has more recently sprung up, as a variety of the mastiff, or a cross between the mastiff and some other breed. Buffon, indeed, represents the bull-dog as the parent race, and the mastiff as derived from it, but this opinion is generally rejected as erroneous. The bull-dog has been regarded as a distinct species by some naturalists, and named *canis Anglicus, C. laniarius,* etc. It is much smaller than the mastiff, but is very strong and muscular. The breadth of muzzle is greater than in the mastiff, and the head is very large, almost appearing as of disproportionate size to the body. "The forehead sinks between the eyes, and the line of the nose rises again at a considerable angle; the lower jaw projects beyond the upper, often showing the teeth, which altogether, with the frequent redness about the eyelids, produces a most forbidding aspect; the ears are partially drooping, unless the terrier blood is crossed in the animal, and the tail is carried high." The hair is short, and the tail taper, and not bushy. The color may be ochry or reddish buff, brindled, fawn, or white, the last being preferred, and should be whole or unmixed, though dogs of two colors are exceedingly common. The bull-dog used seldom to be seen except in the company of persons who delight in dog-fighting and other barbarous sports, but now has sometimes more reputable patrons. It was formerly much employed in bull-baiting, from which it derives its name. It is chiefly remarkable for its savage ferocity, and the pertinacity with which it retains its hold, as if its jaws were locked, and it could not let go. It will hang to the jaw or nose of a bull, although lifted from the ground. Col. Hamilton Smith says he has seen one "pinning an American bison, and holding his nose down, till the animal gradually brought forward its hind feet, and, crushing the dog to death, tore his muzzle out of the fangs, most dreadfully mangled." The bull-dog is also bold enough to attack any animal, however superior in size and strength.

The BULL-TERRIER is a cross between the bull-dog and the terrier. It is smaller than the bull-dog, more lively and docile, and equally courageous. The ears are always

pointed; the best color is white, with some black about the head. It is unrivaled in rat-catching. It is a great favorite as the companion of young men.

BULLER, CHARLES, b. in Calcutta in 1806, was a gentleman whose name falls to be recorded more on account of the hopes which his death in 1848 disappointed, than for the performances of his life. He was educated at Harrow and Cambridge, at both of which he distinguished himself, and for a time studied in Edinburgh, where he had Mr. Thomas Carlyle for one of his tutors. He was called to the English bar in 1830, and entering parliament before the reform bill, continued a member of the lower house till his death. He was still but a rising man when he died. In politics, a philosophical radical, he occupied successively the posts of judge-advocate-general and president of the poor-law commission under whig governments. The interest taken in his career, and his popularity, were, it would seem, largely owing to his amiability and accomplishments for society.

BULLET is the leaden projectile discharged from a musket, fowling-piece, pistol, or similar weapon. When the smooth-bore muskets alone were used by British infantry, the bullets were made by casting. Molten lead was poured into molds; and the molds were dipped in cold water, to hasten the solidification of the lead. The molds were cooled after every few times of using; and the lead was heated only just to the degree for maintaining fluidity. Bullets are now, however, made more expeditiously, and more truly spherical in form, by compressing machines, one form of which has been invented by Mr. George Napier. The lead is first fashioned into a rod about a yard long, by five or six eighths of an inch thick; this rod is passed between rollers to condense it; then between other rollers to press it into a row of nearly globular pieces; then a spherical die gives the proper form to each of these pieces; and, lastly, a treadle-worked punch separates them into bullets. With one of these machines and two dies, nine boys can make 40,000 bullets in a day.

Spherical bullets for the old muskets, carbines, and pistols varied from 14 to 20 to the pound, and from 0.60 to 0.68 of an inch in diameter. There is a particular ratio, depending on the specific gravity of lead, by which the number to the pound will give the diameter, or *vice versâ*.

Such bullets are, however, becoming every year less and less used in the army, being superseded by other forms better suited for rifles. These forms are singularly numerous. Robins' B. was egg-shaped, with the center of gravity at the larger end; Beaufoy's was ovoid, with a hemispherical cavity at one end; Manton's was a spherical ball put into a wooden cup, with projections on the exterior; Greener's was oval, with a plug of mixed metal driven into a hole barely large enough for it; Norton's, Delvigne's Minié's and others, are, or were, of various elongated shapes, mostly with some kind of plug, which, driven into the lead by the force of the explosion, causes it to fill up the grooves in the rifling of the barrel. This expanding or dilating action has been claimed by many inventors; but the government, in 1857, awarded Mr. Greener £1000, as the person who had practically solved the difficulty as far back as 1836. The bullets for the Enfield rifles are now made with extraordinary speed, by machinery of beautiful construction. The machine draws in a coil of leaden rod, unwinds it, cuts it to the required length, stamps out the bullets with steel dies, drops them into boxes, and conveys them away. Each machine, with its four dies, makes 7000 bullets per hour; and four such machines, in an easy day's work, turn out 300,000 bullets. So nearly are the machines automatic, that one man can attend them all. Other machines, attended by children, produce an equal number of little boxwood plugs for filling the cavity at the hinder end of the bullet. The differences between various bullets of modern invention are further noticed under CARTRIDGE and BREECH-LOADING ARMS AND NEEDLE-GUNS.

BULLET-TREE, or BULLY-TREE, a tree found in Guiana, and valued for its wood, which is solid, heavy, close-grained, and durable, and also for its fruit, which is a drupe about the size of a cherry, and very delicious. It is supposed to belong to the genus *mimusops* (natural order *sapotaceæ*, q.v.).

BULLETIN. See BULL.

BULL-FIGHT. Combats of men with bulls, for the entertainment of the public, were common in Greece, particularly in Thessaly, and in Rome under the emperors, though in later times they were forbidden both by emperors and popes. They are still a favorite pastime in Spain and Mexico. In Spain, they were abolished by Charles IV.; but Joseph, Napoleon's brother, re-established them, out of policy, the mass of the Spanish population being passionately fond of the sport. The most magnificent bull-fights were at one time instituted by the monarchs themselves; at present, both in the capital and in the larger towns of Spain, they are held either as private speculations, or for the benefit of public institutions. In Madrid, the bull-fighting season commences in April, and lasts until November. During that time, there is at least one afternoon in every week devoted to the sport. The proceeds go to the funds of the general hospital. The fights take place in a kind of circus, called the *Plaza de Toros*, round which the seats rise one above another, like the steps of a stair, with a tier of boxes over them. The *Plaza* is capable of containing from 10,000 to 12,000 people, who pay a high price of admission, consideriug the rate of wages in Spain; and all go attired

in their best to the spectacle. The best Andalusian bulls are bred at Utrera, the best Castilian ones on the Jarama, near Aranjuez. The latter are the breed usually chosen for fight in Madrid. They are fiercer and more active, but inferior in strength to British animals. The horses engaged in the conflicts are worthless brutes, fit only for the knacker. The men employed in the fight are generally those who have been bred to it as a profession, but occasionally amateurs may take part in it. The bull-fight has been described as a tragedy in three acts. The principal performers in the first are the *picadores;* in the second, the *chulos* are the only actors; the third and last act devolves solely on the *matador*. The *picadores* are all mounted, dressed like Spanish knights of the olden time, and armed with a lance; they take up their position in the middle of the circus, opposite the bull-stalls. The *chulos*, who are on foot, are gay with ribbons, and wear very bright-colored cloaks; they distribute themselves in the space between the barriers. The *matador*, or chief combatant, is also on foot. He is handsomely dressed, and holds in the right hand a naked sword, in the left the *muleta*, a small stick, with a piece of scarlet-colored silk attached. On a sign given by the chief magistrate, a bull is let out from the stalls; the *picadores* stand ready in the arena waiting his charge. With a brave bull, they find all their skill requisite in acting on the defensive; with a cowardly one, they act on the offensive; and should their stabs be ineffectual in rousing the animal to the requisite fury, the poor beast is hooted by the crowd, and ultimately stabbed ingloriously in the spine. Whenever a horse is wounded, the rider betakes himself to flight; and when either the above casualty happens, or a *picador* is thrown, the *chulos* rush in, and attract the bull by their cloaks, saving themselves, if need be, by leaping over the palisade which incloses the circus. At the same time, another *picador* calls off the bull's attention to himself by shouting. When the bull begins to flag, the *picadores* are succeeded by the *chulos*, who bring with them the *banderillas*—i.e., barbed darts about two feet long, ornamented with colored paper flags, which they stick into the neck of the animal. Sometimes these darts have crackers attached to them, the explosion of which makes the bull furious. The *matador* now enters alone to complete the tragic business. As soon as the bull's eye catches the *muleta*, he generally rushes blindly at it; and then the *matador*, if he is well skilled, dexterously plunges the sword "between the left shoulder and the blade," and the animal drops dead at his feet. The victorious *matador* is greeted with acclamations, and not less so the bull, should he wound or even kill the *matador*, in which case, another *matador* steps forth into the arena; but human life is rarely sacrificed. Eight or ten bulls are often dispatched in a single day; twenty minutes being about the time usually taken to slay one.

In Madrid, in June, 1833, 99 bulls were killed in the course of a single week. Bull-fighters are regarded as the lowest class in Spain. They are very ignorant and superstitious; and those who are killed on the spot and die without confession, are denied burial rites.

BULL-FINCH, *Pyrrhula vulgaris*, a bird of the great family of *fringillidæ* (q.v.), a little larger than the common linnet, and of a genus closely allied to the grossbeaks and crossbills. The genus is particularly characterized by the short, thick, rounded bill, of which the sides are inflated and bulging, and the tip of the upper mandible overhangs that of the lower one. The bull-finch is a bird of very soft and dense plumage, of a delicate bluish-gray color above, the under parts of a bright tile-red, the crown of the head and the beak jet black, which color also appears in the greater wing and tail coverts, in the quills, and in the tail-feathers; the wings are crossed by a conspicuous white bar. The colors of the female are less bright than those of the male. The tail of the bull-finch is almost even This bird is not unfrequent in England, Ireland, and the s. of Scotland; and is found in most parts of Europe, from the s. of Norway to the Mediterranean, extending eastward throughout Asia, even to Japan. It frequents woods and gardens, builds its nest in trees or bushes a few feet from the ground, feeds chiefly on seeds and berries in winter, and in spring is excessively destructive to the buds of fruit-trees in those localities in which it is abundant, selecting the flower-buds, and apparently finding them the most palatable of all food. Selby says: "I have known a pair of these birds to strip a considerable sized plum-tree of every bud in the space of two days." On this account, gardeners are sometimes compelled to wage war against the bull-finch

The song of this bird, in a wild state, is very simple, and has no particular quality to recommend it; but it is remarkably susceptible of improvement by education; and trained bull-finches of superior acquirements are sold at a very considerable price. Some of these birds learn to whistle an air very accurately, and with a power and variety of intonation far exceeding their natural song. The ability to whistle several airs well, is rare. The training of these birds is a work both of time and trouble: it is chiefly carried on in Germany. Not less than nine months of training are requisite: it begins when the bird is a mere nestling, and must be carefully continued till after the first moulting; for it is a curious circumstance, that all which has been previously acquired is very apt to be lost at that time, or is afterwards so imperfectly remembered that the bird is of little value. The bull-finch is capable of very strong attachment to those who feed and caress it, and often becomes so thoroughly domesticated as to exhibit no desire for

liberty.—Curious variations of plumage are sometimes observed in it.—Other species of the genus *pyrrhula* are known, natives of different parts of the world; and in this genus some ornithologists include *corythus* of Cuvier, of which one species, the pine-finch (q.v.), or pine grosbeak, is a native of Britain.

BULL-FROG, *Rana pipiens,* a species of frog (q.v.) found in most parts of the United States and Canada, but chiefly abundant in the southern states. It is of a large size, 8 to 12 in. long, of an olive-green color, clouded with black. It receives its name from the remarkable loudness of its voice, which has been compared to the bellowing of a distant bull, and comes in as a hollow bass in the frog concerts which take place in the evening and all night long in marshy places in America. Its voice can be distinctly heard at a distance of 40 or 50 yards. It sits for hours during the day, basking in the sun, near the margin of a stream, into which it plunges with a great leap on the least appearance of danger. It does not confine itself to insect and molluscous food, like smaller frogs, but is said to be partial to young ducks, and to swallow them entire. Audubon says "its flesh is tender, white, and affords excellent eating," the hind legs, however, being the only part used for food. He adds that these parts make excellent bait for the larger cat-fish, and that he has generally used the gun for procuring them, loading with very small shot.

BULL, Golden, applied to the decree of Charles IV. of Germany, published in 1356, to fix the laws for the election of emperors and regulate the number of electors. A similar edict by Andrew II. of Hungary (1222), for similar purposes bears the name.

BULLHEAD, River Bullhead, or Miller's Thumb, *Cottus gobio,* a small fish, abundant in clear rivers and streams, in some parts of the British islands, throughout the greater part of Europe, and in the n. of Asia. It seldom exceeds 4 or 5 in. in length; is of a dark brown color on the upper parts, and white beneath; has rather large fins, with rays slightly produced into spines and prettily spotted; and in general appearance is not unlike the gurnards (q.v.). It is, however, generally regarded as a disagreeable object to the sight, on account of the great size and depressed form of its head, from which it derives its English names; the name, miller's thumb, alluding to the broad rounded form which the last joint of the thumb of a miller used to acquire in times when machinery was ruder than now, by its continual employment in testing the quality of the flour produced, and in turning it over on the fingers for inspection, that it might be known if the mill was doing its work well. The appearance of the B. is rendered still more unattractive by the entire absence of scales, a characteristic of the genus to which it belongs, the whole body and head being covered with a soft skin. Yet it is said to be of a very delicate flavor, and in some countries is much sought after as an article of food. Its flesh, when boiled, is reddish, like that of the salmon. Izaak Walton speaks of angling for the B., and in his pleasant quaint style describes the habits of the fish: "He does usually dwell and hide himself in holes, or amongst stones in clear water, and in very hot days will lie a long time very still, and sun himself, and will be easy to be seen upon any flat stone, or any gravel, at which time he will suffer an angler to put a hook baited with a small worm very near into his mouth, and he never refuses to bite, nor indeed to be caught, with the worst of anglers."—The other British species of the genus *cottus* (q.v.) are marine. The name B. is not usually given to any of them. A sea-fish of a nearly allied genus (*aspidophorus*) is sometimes called the Armed Bullhead; it is also known as the Pogge (q.v.).—The river B. differs from the marine species of the same genus, in having only one short spine on each side of the head, on the *preoperculum.*

BULLHEAD (*ante*), a popular name applied to several species of fresh and salt water fish found in the eastern parts of America, and belonging to the genera *cottus* and *acanthocottus.* The common B., often called the "sculpin," is well known to anglers for its scarecrow form and colors. They are voracious, devouring small fish, crabs, decayed flesh, etc., and frightening away such fish as they cannot eat. They vary greatly in size, but are usually small, and seldom used for food.

BULLINGER, Henry, the friend of Zwingli, and one of the chief reformers in Switzerland, was born at Bremgarten, in the canton of Aargau, July 18, 1504. He studied at Cologne, where he became acquainted with the writings of Luther; and during the year 1527, he attended the theological expositions of Zwingli, and went along with the latter to the religious conference held at Bern in 1528, the result of which was the reformation of the canton. In 1529, he married Anna Adlischwyler, formerly a nun, who bore him eleven children. By a powerful sermon which he preached at Bremgarten, on Whitsunday, 1529, B. induced his whole congregation to make a profession of Protestantism. In 1531, he was compelled by the Catholic party to flee from the canton, and went to Zurich, where, in the following year, he was appointed pastor of the principal church. In the controversy on the eucharist and the affairs of the Anabaptists, B. distinguished himself by his integrity and moderation; and in his house at Zurich several German theologians, compelled to leave their country, were hospitably sheltered. He took part in drawing up the first Helvetic confession at Basel, in 1536, and in establishing a close relation between the Swiss and Anglican churches. He died Sept. 17, 1575. His writings are numerous. The most important is a *History of the*

Reformation, which was first published at Zurich, 1838. His sermons have been translated into English. See the Lives of B. by Hess (1828) and Christoffel (1875).

BULLION usually means uncoined gold and silver, in bars or other masses; but in discussions on the currency, the term is frequently employed to signify the precious metals coined and uncoined. The origin of the word B. in its present sense, as well as that of the French *billon* (q. v.), and the corresponding Spanish *vellon*, seems to be as follows: B. originally meant the mint, where the alloy for the coinage was prepared, and the coin stamped (either from the Lat. *bulla*, a round boss or stud, or stamp; or from the verb *bullare*, to boil or bubble); and hence it came in England to signify the standard metal of which the coins are made. In France, where the kings debased the currency much more than ever took place in England, *billon*, the mint, came to signify the base mixture issued therefrom.

It is a question not yet satisfactorily settled, how far any great increase in the supply of B. has that effect in lessening the value of money, and consequently raising prices, which has always been very naturally attributed to it. It may indeed be maintained with some plausibility, that if B. were capable of being produced to such an extent beyond the actual demand for it as to glut the market, it would cease to be that general standard of money value which it has become, just because it is of all others the article which is steadiest in requiring a certain outlay of labor to produce it. Rises in prices have accompanied large supplies of gold, but they have also accompanied large supplies of other commodities indicative of a great increase in riches. It is certain that great increases in the supply of B. do not, as in the case of other goods, glut the market. For some years past, the supply of gold, owing to the new fields opened in America and Australia, has been quadrupled, with certainly no more influence on prices than what a general increase in prosperity might cause. There is, it will be observed, this great difference between gold and other commodities, that besides what may be within the crust of the earth, there is a great mass which has been accumulating for thousands of years in the possession of mankind, which comes forth as it is wanted. A few millions of tons of iron, or bales of cotton, beyond the usual annual average, would perhaps add a hundred per cent to the available quantity for consumption; but a few millions of pounds' worth of gold, having to be counted with all the gold in existence in the world, makes a scarcely perceptible addition to the stock.

The term B. is in this country associated with the memorable BULLION REPORT of 1810. In the year 1797, by what was called the restriction act (see BANK), the bank of England was restrained from paying its notes in gold. There thus came to be two separate and independent currencies in the country—one of B., the other of paper.. They came to differ in value from each other so much that in the year 1813, gold, of which the mint price was £3 17*s.* 10*d.* per ounce, was actually worth, in bank paper, £5 10*s.*, or, in other words, the one-pound bank-note was worth 14*s.* 2*d.* There were various opinions on the cause of this difference. Some people simply said that gold was dear, taking paper as the standard of value; others said it was owing to our exports not balancing our imports; others, to too great facilities in discounting, by which money was advanced on bad security; and in general, it was held that there could be no overissue of paper-money, if it was backed by good security, and employed only for genuine transactions, and not in fictitious credits. In the meantime, the select committee on the high price of gold B., had been wishing to get, not through theories or speculations, but through actual facts, at the truth. The work of the committee was chiefly conducted by Mr. Horner, aided by sir Robert Peel, then a young man; and both of them entered on the task without any prepossession, and the desire to find the truth. They established the conclusion, among other important truths, that paper-money is always liable to be overissued, and consequently depreciated, unless it be at all times immediately convertible into gold, and the monetary policy of the empire was subsequently established on this principle. A full analysis of the B. report will be found in Macleod's *Dictionary of Political Economy*.

BULLITT, a co. in n. Kentucky, on Salt river and Rolling fork, intersected by the Louisville and Nashville, the Bardstown, and the Lebanon branch railroads; 250 sq.m.; pop. '80, 8521—1305 colored. Productions chiefly agricultural. Co. seat, Shepherdsville.

BULLOCK, a co. in s.e. Alabama, on the Conecuh river, the Mobile and Girard, and the Montgomery and Eufaula railroads; 750 sq.m.; pop. '80, 29,079—22,143 colored. Productions, corn, cotton, etc. Co. seat, Union Springs.

BULLOCK, a co. in s.e. Georgia, between the Ogeechee and Cannouchee rivers; 900 sq.m.; pop. '80, 8053—2258 colored. It is level, with poor soil, in large part covered with pine forests, and abounding in game. Corn, cotton, and sweet potatoes are raised. Co. seat, Statesborough.

BULLOCK, ALEXANDER HAMILTON, LL.D. See page 882.

BULL RUN, a small stream in n.e. Virginia, falling into the Occoquan about 25 m. s.w. of Washington, the site of two important battles early in the war of the rebellion. The first battle took place July 21, 1861, the national forces commanded by gen. McDowell and the confederates by gens. Johnson and Beauregard. The forces were about 28,000 for McDowell and very nearly the same number on the other side, though not more than

18,000 union men were actually in the conflict. Until about 4 P.M. the advantage was evidently with the union side; but at that time an impetuous charge from Beauregard's whole line turned the tide, and the union army was completely routed and fled as best they could across the stream to Centreville, where a council of war was held and a retreat to Washington determined upon. The union loss was: killed, 481; wounded, 1011; missing, 1460. The confederate loss was: killed, 378; wounded, 1489; missing, 30.

On the 29th and 30th of Aug., 1862, the second battle was fought, gens. McDowell and Pope commanding the union forces, with gens. Lee, Jackson, and Longstreet on the other side. On the last day the unionists were defeated and fell back to Chancellorsville, where they suffered another repulse, and then retired to Washington. The forces engaged were about 35,000 union, and 46,000 confederate. No complete report of the union losses was given, but the figures for killed, wounded, captured, and missing are put at 11,000; Lee reported the confederate loss to be 1090 killed, and 6514 wounded, but the report was incomplete, others making the total loss 8400. The confederates call these engagements the "first and second battles of Manassas."

BULLS AND BEARS, a common designation in the stock market for two classes of operators; the "bulls" being those who seek to advance prices, and the "bears" those who endeavor to bring them down. A fanciful derivation of the term is that a bull tosses up with his horns, while a bear tears down with his claws.

BULL'S EYE, among the rigging of a ship, is a sort of small pulley in the form of a ring, with a rope spliced round the outer edge, and another sliding through a hole in the center.—B. E., in rifle practice, is the small black center within the circle of the target.

BULL-TERRIER, a cross-breed of the regular bull-dog and various kinds of terriers, having more docility than the bull-dog and all the sagacity of the terrier. The bull-terrier is a favorite house-dog, noted for watchfulness and its intense enmity to rats.

BULL TROUT, *Salmo eriox* or *S. griseus*, a fish nearly allied to the salmon, and like it, migratory in its habits, ascending rivers, in which it deposits its spawn, but living chiefly in the sea. It occurs in many of the rivers of Britain, and is not unfrequently taken in the Tweed and its tributaries. It is frequently called the GRAY TROUT, sometimes simply the GRAY, and is the SEWEN of the Welsh rivers. It sometimes attains the weight of 20 lbs., although it is more commonly under 15 lbs. weight. It is less elegant in form than the salmon; the head and nape of the neck are thicker in proportion; and the tail, beyond the adipose fin, is more bulky and muscular; the tail fin is square at the end in young fish (in some places called *whitlings*), and in older ones, becomes convex by the elongation of the central rays, whence the name *roundtail* sometimes given this species. The scales are rather smaller than those of a salmon of equal size, and the color is less bright; the males in the spawning season being reddish brown, the females blackish gray; at other times the general color is like that of the salmon trout. The B. T. agrees with the salmon in having only a few teeth on the most anterior part of the *vomer* (the bone which runs down the center of the palate); while the salmon trout, the common trout, and the great lake-trout, have a long line of teeth there: the teeth are larger and stronger than those of the salmon; there are differences also in the form of the gill-covers. To anglers the B. T. is next to the salmon as a prize, and by many is mistaken for it. The flesh is paler in color, coarser, with much less flavor, and is much less esteemed.—The name B. T. has been also given to the HUCHO (*salmo hucho*), or salmon of the Danube, which sometimes attains the size of 30, or it is said, even of 60 lbs.

BÜLOW, FRIED. WILH. VON, a famous Prussian gen. in the war of liberation, was b. in 1755, entered the army young, and soon distinguished himself. When Prussia declared war with France in 1813, it was B. that commanded in the first successful encounter with the French at Möckern, April 5, and revived the self-confidence of the army after the adverse battle of Lützen. His victories over Gudinot and Ney at Grossbeeren and Dennewitz, saved Berlin, and inflicted severe loss on the enemy. He acted a conspicuous part in the battle of Leipsic, and by taking possession of Montmartre, finished the campaign of 1814. The king acknowledged his services by an estate worth £30,000, and the title of count Dennewitz. In the campaign of 1815, he joined Blücher by forced marches, and headed the column that first came to the aid of Wellington at Waterloo. He died at Königsberg, 11th Jan., 1818.

BÜLOW, HANS GUIDO von, a celebrated pianist and composer, was b. at Dresden, Germany, Jan. 8, 1830. His father, a well-known author, who intended that he should study law, and was very much opposed to his adopting music as a profession, refused to support him after he had given up his law studies at Berlin. He was assisted by Liszt, who recognized his talent, and Richard Wagner secured him a position as leader of orchestra at a theater in Zurich in 1850. During the year 1851–52 he devoted himself to the study of the piano at Weimar, under the tuition of Liszt. In 1852, he made his first appearance in public as a pianist; edited the *Neue Zeitschrift für Musik*, and composed his famous overture to *Julius Cæsar*, which was performed with great success. In 1855, he became leading professor in the conservatory of music at Berlin, and in 1857, married Cosima, daughter of Liszt, from whom he was divorced in 1869. In 1875, he came to

this country, and made a very successful concert tour. He never used his own pieces at public performances, although his compositions are very numerous and often chosen by other artists. His larger works number over 30, and he also composed many songs and choruses. B. was considered one of the leading pianists of modern times. He d. 1879.

BULOZ, François. See page 882.

BULRAMPUR', a t. of Oude, India, near the frontier of Nepaul, in n. lat. 27° 24', e. long. 82° 15', on the Raptee, in a plain, 90 m. n.e. from Lucknow. It is a town of considerable size, but mostly of mud houses, covered with thatch. From B. there is a magnificent view of Dhawalagiri. The town is on one of the most frequented routes between Lucknow and Nepaul, so that during spring and summer it is much thronged by traders, exchanging the products of Hindustan and Thibet. Pop. '71, 14,026.

BULRUSH, an English popular name for large rush-like or reed-like plants growing in marshes, not very strictly limited to any particular kind. Some authors employ it in a restricted sense as the designation of plants of the genus *typha*, also known as cat's-tail or reed-mace. See Typha. It is perhaps more commonly restricted to large species of the genus *scirpus* (q.v.), also called club-rush, and particularly to *S. lacustris*, a common British plant, found also in all the northern parts of the world, growing about the muddy margins of lakes and ponds, with a creeping root and round stems varying from 2 to 8 ft. in height, which are almost leafless, and bear their flowers in compound umbels of small brown spikelets on their side. The root is astringent and diuretic, and was formerly employed in medicine; but the stems are the most useful part of the plant, being much employed for making chair-bottoms, mats, etc.; also by coopers for filling up spaces between the seams of casks, to which purpose their spongy nature particularly adapts them, and not unfrequently for thatching cottages.

BUL'SAR, a seaport of India, in the British district of Surat, presidency of Bombay, on the estuary of a small river of the same name, which falls into the gulf of Cambay. It is 44 m. s. of Surat. It is a thriving place, with manufactures of ginghams, and a considerable trade in grain, salt, and sugar. Pop. '71, 11,313, chiefly weavers and sailors, but partly also employed in agriculture.

BULTI, or Little Thibet', a territory lying on the upper Indus beyond the Himalaya, and forming a sort of debatable land between India and Tartary. It is immediately to the n. of the valley of Cashmere, with which it is politically connected by conquest. It occupies about 8000 sq.m., extending in n. lat. between 34° 30' and 36°, and in e. long. between 75° and 77°. With an average elevation of about 7000 ft. above the sea, B. is surrounded by mountains of nearly the same height above its own level. Hence the temperature is such that only snow falls in what ought to be the rainy season, though in summer the thermometer ranges at noon from 70° to 90° F. European fruits are said to be plentiful. The inhabitants are of the Mongolian race, and chiefly Mohammedans. Among the animals are the sha, the large-horned goat, the sheep, the musk-deer, and the ibis. The only town of consequence is the capital, Iskardoh, which, in fact, sometimes gives its name to the whole province.

BULUBGURH', or Ballamgarh, a t. of India, the principal place of a jaghire of the same name, called also Furreedabad. The town is situated on the route from Delhi to Muttra, 29 m. s. of Delhi, in a pleasant well-cultivated country. The town is not large, and is very crowded, surrounded by a high brick wall, with mud bastions and a deep ditch. The jaghire has an area of 190 sq.m., and its pop. is supposed to be about 57,000. The British have never interfered with the civil or criminal affairs of the jaghire, except when their interference was requested, during the minority of the present rajah; but the rajah of B. derives his rights from the British government. The revenue of the state is estimated at 160,000 rupees. The rajah maintains a small force of 100 cavalry and 350 infantry.

BULWARK, in military matters, was the old name for a rampart or bastion. In a ship, the bulwarks are the boarding above the level of the upper deck, nailed to the outside of the timber-heads and stanchions. In ordinary vessels they form a parapet, protecting the seamen from the waves, and prevent loose articles from being swept off the deck; in men-of-war they, in addition, serve to protect the men from an enemy's shot. In an inquiry made a few years ago concerning the availability of merchant-steamers as ships of war, it was found that the bulwarks would not afford sufficient protection to the men from musket-shot; but that if hammock-stanchions were fixed all round the bulwarks, and the men's hammocks placed in a netting upheld thereby, a very good protection might be obtained.

BULWER, Sir Henry Lytton, G.C.B., the right hon., diplomatist and author, an elder brother of the late lord Lytton, was born in 1804, entered the diplomatic service in 1827, and was attached successively to the British embassy at Berlin, Brussels, and the Hague. In 1830, he entered parliament, and during the following seven years he represented, in order, the constituencies of Wilton, Coventry, and Marylebone. In 1837, he became secretary of embassy at Constantinople, where he negotiated and concluded a treaty which is the foundation of our present commercial system in the east. In 1843, he was made minister plenipotentiary to the court of Madrid, and concluded the peace between Spain and Morocco in the following year. Whilst in Spain, his firmness and candor proved a source of great inconvenience to Narvaez, the Spanish soldier-diplo-

matist of that day, and who, pretending to have discovered the complicity of the British plenipotentiary in certain plots against the Spanish government, ordered him to leave Madrid. Both parties in the house of commons approved of the whole course of B.'s conduct while at the court of Madrid, and her majesty awarded to him the highest decorations of the order of the Bath. He afterwards proceeded to Washington, where he evinced equal art in conciliating the temper of the people, and maintaining the interests of his own country. In 1852, he was sent to Tuscany as envoy extraordinary; and in 1856 was nominated by lord Palmerston commissioner at Bucharest for investigating the state of the Danubian principalities. As British commissioner, he called forth from every minister and from every government concerned the warmest expressions of approval, and all concurred in recommending him for the post of ambassador to the Ottoman porte, on the return of lord Stratford de Redcliffe, in the spring of 1858. Sir Henry Lytton became a peer in 1871, with the title of lord Dalling and Bulwer. He died in 1872. His works include a *Life of Palmerston; Historical Characters; An Autumn in Greece; France, Social, Literary, and Political;* and a *Life of Byron.*

BULWER-LYTTON, Edward Robert, Earl, only son of the English novelist, b. 1831; educated by private tutors; went into diplomatic service in 1849 under his uncle, sir Henry, who was then British envoy to the United States; afterwards served diplomatically at Florence, Paris, the Hague, Vienna, Copenhagen, Athens, Lisbon, Madrid, and again at Vienna and Paris. He succeeded to his title on the death of his father in 1873. In 1874, he was sent again to Lisbon as ambassador, and 1876–80 was viceroy of India, where, Jan. 1, 1877, he presided at the ceremonial proclamation of Victoria as empress of India. In literature he is widely known, first as "Owen Meredith," the author of many poems, the chief of which is *Lucile.* Other works are *Tannhauser, or the Battle of the Bards; Neville Temple; Julian Fane;* songs of Servia; *The King of Amasis; Chronicles and Characters; Orval, or the Fool of Time;* imitations in verse from various languages; *Fables in Song; Biography of his father,* 1884.

BULWER LYTTON, Sir Edward. See Lytton.

BUMBOAT, a boat employed to carry provisions and other articles from harbors and ports to vessels lying at some distance from the shore. Boats of this kind belong to a class of petty traders, who in England are, for the most part, women. The provisions commonly offered for sale are soft bread, butter, fruit, vegetables, fish, and fresh meat —the fish fried, and the meat roasted, if wanted. Among the other articles are included shirts, drawers, stockings, gloves, pipes, needles, thread, and a variety of odds and ends. The less respectable of the B. traders try to smuggle spirits on board; but if this is discovered, it leads to instant punishment. In fitting out and also in paying off ships in H. M. navy, the B. people are allowed on board for a certain length of time daily; but when a ship is in active commission, they come alongside only at meal-hours. Among the class of B. people generally, there is no little acuteness and enterprise. They learn all particulars about ships going and coming, and will even write to far-distant ports to secure a vessel's patronage. In their dealings, they of course prefer ready money, but in certain cases they give credit, and it is understood lose little by their liberality; for any attempt at evasion of payment by any of the crew, meets the displeasure of commanding officers. From Hong-Kong up to the Bogue forts, and in other Chinese waters, bumboats frequently accompany vessels, and are apt to become troublesome. From Malta and some other places in the Mediterranean, the bumboats also haunt vessels on short cruises, in the hope of doing a little trade.

BUMKIN, or Boomkin (diminutive of *boom*), on shipboard, is a short boom which projects over each bow of the ship, to aid in extending the lower edge or clue of the foresail to windward—in nautical phrase, "to board the fore tack to." In a boat, the B. is a small outrigger over the stern, used for extending the mizzen.

BUMMALOTI, *Saurus ophiodon*, a fish of the family *scopelidæ* or *sauridæ*, often regarded as a subdivision of the great family *salmonidæ.* It is a marine fish, a native of the coasts of India, particularly of the Bombay and Malabar coasts, from which it is exported in large quantities, salted and dried, to other parts of India, being highly esteemed for its rich flavor, and often used as a relish. In commerce, it is known not only by the name B., but by the singular appellation of *Bombay duck* It is a fish of elongated form, with large fins and a very large mouth, the gape of which extends far behind the eyes, and which is furnished with a great number of long, slender teeth, barbed at the points. It is extremely voracious.

BUNCE, William Gedney. See page 882.

BUNCOMBE, a co. in s.w. North Carolina, n.e. of the Blue Ridge, on French Broad river and the Western North Carolina railroad; 450 sq.m.; pop. '70, 15,412—2303 colored; in '80, 21,910. The surface is rough, but the soil is fertile and good for cattle-raising. There are warm springs in the n.w. part. Corn, wool, and tobacco are the chief productions. Co. seat, Ashville.

BUNDELCUND', a territory of Hindustan, between Gwalior on the w. and the Jumna, which separates it from the Doab, on the n.e. The area formerly known as B. included four districts belonging to the British north-western provinces, (Banda, Jalun, Jhansi, and Hamirpur). Now B. is officially used only for the "Bandalkhand agency," a subdivision of the Central India agency and in this sense is applied to a group of nine native

states, and twenty-five petty jaghires under native princes. The area of the agency is 10,600 sq.m., and the pop. estimated (1872) at 1.278,000. Studded, as B. is, with isolated rocks, rising precipitously from its surface—each of them a nucleus, as it were, of independence—it has generally been very much subdivided. Notwithstanding that it is well watered, the climate renders irrigation indispensable; and it is accordingly interspersed, at the cost of great labor and ingenuity, with artificial dams. B., though not destitute of woodlands, presents rather jungle and copse than heavy timber. It is said to possess inexhaustible deposits of iron-ore and some coal. The principal towns of B. are Calpee, Jhansi, Callinger, Banda, Jalun, and Chaturpur. The first three are noticed in their places, Callinger being famous for its cave-temples, and Jhansi and Calpee having acquired celebrity in the mutiny of 1857–58.

BUN'DI, or BOONDEE, a t. of India, in n. lat. 25° 26′, e. long. 75° 43′, 190 m. s.w. from Agra, the capital of a small state of the same name. It is situated in a valley nearly surrounded by rocky hills. The palace of the rajah is on the slope of the hill above the town, and is of great magnificence and beauty, consisting of a number of parts built at different dates, but harmonizing extremely well together. The town contains few notable edifices. It has two good bazaars, it is a place of little commerce. It is celebrated for its iron manufactures.—The raj or state of Bundi has an area of 2291 sq. miles. A range of mountains running n.e. and s.w., divides two nearly equal level tracts —that on the s.e. extending to the river Chumbul, and that on the n.w. to the base of the mountains towards Ajmere. The climate is said to be unhealthy. Although the rajah and dominant portion of the inhabitants are Rajpoots, the greater part of the population, particularly in the mountains, are Meenas, supposed to be an aboriginal race, who are indefatigable freebooters. The military force of the state, including the troops of the feudal chiefs and the police force, is 6170 men. The revenue is about £50,000. Pop. of B. 224,000.

BUNGALOW, a species of rural villa or house, so called in India. Bungalows which form the residence of Europeans are of all sizes and styles, according to the taste and wealth of the owner. Some are of two stories, but more usually they consist of only a ground floor, and are invariably surrounded with a veranda, the roof of which affords a shelter from the sun. In the chief cities of Calcutta, Madras, and Bombay some of the bungalows are really palatial residences, while in the mofussil they are of more moderate pretensions. In general, they are provided with exterior offices, to accommodate the large retinue of domestics common in Indian life. Besides these private bungalows, there are military bungalows on a large scale for accommodating soldiers in cantonments; likewise public bungalows, maintained by government for the accommodation of travelers, and in which seem to be blended the characters of an English road-side inn and an eastern caravanserai. These bungalows, though they vary greatly in actual comfort, are all on the same plan. They are quadrangular in shape, one story high, with high-peaked roofs, thatched or tiled, projecting so as to form porticoes and verandas. The B. is divided into "suits" of two, three, or four rooms, provided with bedsteads, tables, and chairs; windows of glass, and framed glass doors. Off each room is a bath-room, and earthen jars of cool water. Travelers are expected to carry their servants, cooking-apparatus, wine, beer, bedding, etc., with them; but the khitmutgar of the better class of bungalows supplies table-ware, condiments, and even sometimes food and liquors, and he is usually skilled in cooking. Government charges one rupee, or two shillings a day, to each traveler for the use of the bungalow. A book is kept, in which travelers enter their names, the time of their arrival and departure, with the amount paid, and any remarks regarding the state of the B. and its attendance he may think proper. Natives seldom stop in these public bungalows, for though legally open to all, they are almost exclusively resorted to by Europeans; and natives even of good condition are fain to seek "the squalid desolation of a tottering caravanserai," or village "dhurrumsala." At every travelers' B. is stationed a government peon, who acts as watchman, and is bound to assist travelers' servants in procuring supplies of fuel and food in the nearest village. The distance between each B. on a trunk-road is generally about 12 or 15 m.—an Indian day's journey. The introduction of railways will very soon put an end to the present system of traveling in India—a fact greatly to be desired, as the annoyance experienced moving slowly on with baggage and servants at the rate of a stage a day is almost inconceivable.

BUNGAY, a market-t. of the co. of Suffolk, England, 30 m. n.n.e. from Ipswich. It occupies the sides and summit of a gently rising hill, on the right bank of the Waveney, and is a well-built town, with wide streets, the principal ones diverging from the market-place. The town grew around Bungay castle, which is supposed to have been erected by the Bigods, earls of Norfolk, and of the walls of which some ruins still remain. The ruins of a Benedictine nunnery are also to be seen in the town. The church of the Holy Trinity is an edifice with a round tower, supposed to be of the time of Edward the confessor. There are numerous places of worship, belonging to different denominations, and schools, charitable institutions, assembly-rooms, etc. What was formerly the theater is now used as a corn-hall. B. carries on a considerable trade by the river Waveney in corn, malt, flour, coals, and lime. Pop. '61, 3805; '81, 3579.

BUNIAS, a genus of plants of the natural order *cruciferæ*, distinguished by *incumbent* linear spirally twisted cotyledons (q.v.), and a nut-like silicule (or round pod) with 2 to 4 cells. Only a few species are known, natives of the Levant. One of these, *B. orientalis*, is cultivated in some countries—particularly in France—as a field-crop, for the sake of its leaves, which are used for feeding cattle. It was introduced into Britain more than 100 years since, but its cultivation has never become general, the amount of herbage which it yields being comparatively small. It is sometimes called HILL MUSTARD.

BUNION is a painful condition met with in the joints of the feet, most commonly at the junction of the great toe with its metatarsal bone. It is caused by a gradual displacement of the bones, the toe itself turning outwards, and leaving the head or further extremity of the metatarsal bone projecting inwards. Over the latter, the skin is generally thin, and occasionally a bursa (sac) is present between the skin and bone. The pressure of a boot causes this bursa to inflame, and this may go on to suppuration or painful ulceration. Rest, poulticing, and such remedies are generally sufficient to subdue any inflammatory attack, and wearing a shoe so constructed as to save the B. from pressure, will probably prevent a recurrence of painful symptoms; but amputation and excision of the ends of the bones have been resorted to for the cure of the troublesome distortion.

BUNION is a term applied in surgery to enlarged bursæ, or synovial sacs, situated in the anterior part of the foot, and especially over the metatarsal joint of the first or the fifth toe (see FOOT), and accompanied by more or less distortion of the joint. In the great majority of cases, bunions are directly produced by the pressure of badly-fitting boots; and if the boots are constructed of patent leather, or any material which stops the excreting action of the skin, this, too, may be regarded as an indirect cause of their formation. A bunion begins as a painful and tender spot over one of the metatarso-phalangeal joints; the part gradually enlarges, and there are indications of an effusion into a natural bursa or a newly-formed sac. The progress of the affection may stop here, the bursa remaining, and serving to protect the subjacent parts from pressure; but far more frequently it undergoes repeated attacks of inflammation, causing its enlargement; or becomes the seat of corns; or suppuration of the contents of the cyst ensues. The last accident may be followed either by obliteration of the cyst, and cure, or by a troublesome form of ulcer, especially in persons of languid circulation.

It is only in its early stage that there is any hope of removing the disease; subsequently, the treatment must be only palliative. The tender spot that precedes the enlargement should be covered by night with wet lint and oiled silk, while by day a boot or shoe exerting no pressure on the part should be worn. If the part is very tender, it may be covered during the day with soap-plaster spread on wash-leather. As soon as a cyst can be detected, the part should be occasionally treated with strong tincture of iodine, with a view of promoting absorption. The writer of the article on this subject in Holmes's *System of Surgery*, recommends an ointment of biniodide of mercury (ten grains to an ounce of lard) for the cure of bunions when uninflamed, and for such as have much fluid within them. It should not be applied so constantly as to blister the skin. When, from any cause, inflammation takes place in the sac, water-dressing, or a poultice, should be applied; and as soon as there are definite signs of suppuration, a free incision should be made, which at once relieves the pain, and is often followed by a complete cure.

The ulcers resulting from the bursting of a bunion are very difficult to heal, especially in old persons whose circulation is languid. Stimulating local applications, such as ointment of resin, should be applied, while opium and stimulants should be prescribed for internal use, together with nourishing diet. Such ulcers, under the best treatment, not very unfrequently form the starting-point for senile gangrene.

BUNKER'S HILL. See CHARLESTOWN.

BUNKUM, a phrase used in the United States to signify an oratorical display in favor of a sham proposal, in order to catch popular applause. A member of the legislature, for example, desirous of standing well with his constituents, makes a flaming speech in favor of a measure in which they are interested; but with the knowledge that the measure is impracticable, and will not be carried. In fact, the speaker does not want to carry it; his sole object is to impose on his supporters, and acquire the character of a meritorious public leader. Such is speaking for bunkum. In some instances, the state legislatures enact laws brought forward on these dishonest grounds—the whole members, or at least a large majority of them, having no other object than bunkum. The consequence is, that many laws, agitated for by popular factions, remain a dead-letter, unless they happen to be enforced by clubs organized for the purpose. The word B. is said to be a corruption of Buncombe, the name of a county in North Carolina, the representative of which informed congress on one occasion that he was merely speaking "for Buncombe."

BUNNER, HENRY C. See page 882.

BUNO'DES GEMMA'CEA, a species of the order actinoida. See ANEMONE, SEA, *ante*.

BUNSEN, Christian Karl Josias, Baron, one of the most distinguished statesmen and scholars of Germany, was b., 25th Aug., 1791, at Korbach, in the principality of Waldeck, and studied philology at Göttingen (1809–13) under Heyne. He had been appointed teacher in the gymnasium of Göttingen in 1811, but quitted the position in 1813; and in pursuance of a course of study of old and middle high German, begun in company with Lachmann, and to extend his knowledge of the Germanic tongues, went to Holland, and afterwards to Copenhagen, where he learned Icelandic from Finn Magnussen. The historical works of Niebuhr and his character as a politician had filled B. with enthusiasm, and he spent some months of 1815 in Berlin, in order to become personally acquainted with the historian. In 1816, he went to Paris, and studied Persian and Arabic under Sylvestre de Sacy, and in the same year to Rome, where he married. Niebuhr, then Prussian ambassador, took the greatest interest in the scientific pursuits of B., and procured (1818) his appointment as secretary to the embassy. The residence of the king of Prussia, Friedrich Wilhelm III., in Rome in 1822, had a decided influence on his subsequent career. In the course of a conversation in which B. had disagreed with the king, the latter asked his views on the Prussian ritual (*Agende*) and hymn-book question, then much agitated. Though these views were very different from what the king had been accustomed to hear, he took them in good part, and with expression of his personal regard, requested B. to continue in the state service. On Niebuhr's departure from Rome (1824), B. conducted the embassy provisionally for a time, and was then appointed resident minister (1827). Living in intimate intercourse with Niebuhr, B. had employed the time in deepening his investigation into the philosophy of language and religion; and had made, on the one hand, the philosophy of Plato and the constitutions of antiquity; on the other, biblical inquiries, church history, and liturgies—objects of special attention. Though not within the scope of the great plan of his life, he contributed largely to the *Beschreibung der Stadt Rom* (Description of Rome), 3 vols. (Stutt. 1830–43); the greater part of the topographical communications on ancient Rome, and all the investigations into the early history of Christian Rome, are by him.—The first visit of Champollion to Rome formed an epoch in B.'s antiquarian studies. He was a zealous hearer of Champollion himself, and also encouraged Lepsius (q.v.) to the study of hieroglyphics. The archæological institute, established in 1829, found in B. its most active supporter. When he founded the Protestant hospital on the Tarpeian rock (1835), he also built, adjoining his own house, a place of meeting for the institute; and labored earnestly for the cause of Protestantism. The king of Prussia had often asked his advice in the matter of the ritual, but had not adopted it. B. then, along with the chaplain, introduced (1825) into the chapel of the embassy at Rome a liturgy modeled after his own views, and sent a report (1828) to the king of the result. The king had this liturgy printed, and wrote the preface with his own hand. This work never came into the hands of the trade; but the most part of it was embodied in the *Allegemeine evang. Gesang- und Gebetbuch*, printed (1846) without the author's name, in the Rauhe Haus, Hamburg, which may be considered as the second edition of the *Versuch eines allgemeinen evang. Gesang- und Gebetbuchs* (Attempt at a General Evangelical Hymn and Prayer Book), Hamb. 1833.

In 1841, he was sent on a special mission to London, to negotiate the erection of an Anglo-Prussian bishopric in Jerusalem, and was shortly afterwards appointed ambassador at the English court. It is understood that, on occasion of a visit to Berlin in 1844, he was asked to write down his views on the question of granting a constitution to Prussia; and that in consequence he presented a series of memorials representing the urgency for a deliberative assembly, and also made a complete plan of a constitution closely resembling the English. In the Schleswig-Holstein question, B. strongly advocated the German view, in opposition to Denmark, and protested against the London protocol of 1850. But in the midst of all his political duties, B. continued unabated his literary and philosophical pursuits, the results of which have from time to time appeared. His views regarding the part that Prussia should act in the eastern question not being, it is understood, in accordance with those of his court, he ceased, in 1854, to represent Prussia at the court of England, and retired to Heidelberg. In the estimation of Englishmen, B. must ever hold a high place. No foreigner has ever shown a deeper appreciation of their national characteristics, or a heartier love of their social and political liberty. It must also be acknowledged that he has done service to the cause of enlightened Christianity, for while in England, he was regarded by those who knew him both as the most philosophical and most reverent of lay theologians. His chief works are: *De Jure Atheniensium Hæreditario* (Gött. 1813); *Die Kirche der Zukunft* (the Church of the Future—translated into English, and published by Longman), Hamb. 1845; *Ignatius von Antiochien und Seine Zeit* (Ignatius of Antioch and his Time), Hamb. 1847; *Die drei echten und die vier unechten Briefe des Ignatius von Antiochien* (The Three Genuine and the Four Spurious Epistles of Ignatius of Antioch), Hamb. 1847; *Ægyptens Stelle in der Weltgeschichte* (Egypt's Place in the World's History—translated into English by Cottrell), Hamb. 1845–57; *Die Basiliken des Christlichen Roms* (The Basilicas of Christian Rome), 1843; *Hippolytus und seine Zeit* (Hippolytus and his Time), 1851; *Christianity and Mankind*, 1854; *Gott in der Geschichte* (God in History), 1857; and the *Bibelwerk*, which B. hoped to make his chief work, of which only a part appeared before his death, which took place in 1860. See *Memoir* by his widow (1868).

BUNSEN, Frances, Baroness. See page 882.

BUNSEN, Robert Wilhelm, a distinguished German chemist, b. at Göttingen, where his father was a professor, on March 31, 1811. He entered the university of his native town in 1828, where he devoted himself to the study of the natural sciences, especially to zoology and chemistry. He afterwards prosecuted his favorite studies at Paris, Berlin, and Vienna. After having held the post of professor at Cassel, Marburg, and Breslau, successively, B. was, in 1852, appointed to the chair of chemistry at Heidelberg, where he has since remained. He has published numerous papers on physics and geology, as well as on chemistry. The charcoal pile and the burner which bear his name are in extensive use. That the hydrate of oxide of iron is an antidote to arsenic, is an important fact which was made known by him, along with his friend Berthold, in 1837. B. was the first to produce magnesium in large quantities; and, in 1860, he invented the magnesium light, which has proved so important to photography. But the greatest discovery with which his name is associated, is that of the spectrum analysis—made in conjunction with his friend Kirchoff—which has been the means of working so many wonders in chemistry, and revealing so much to astronomers. Its first result was the discovery of two new metals. B. is not only a prolific discoverer in chemistry, but he has proved himself also one of its most successful teachers. His manner of demonstration is very happy. We have from his pen: *Descriptio Hygrometrorum* (Göttingen, 1830); *Eisenoxydhydrat* (2d ed., 1837); *Gasometrische Methoden* (1857; English by Roscoe); and other papers. The government of Baden made him a privy-councilor in 1863.

BUNT, a disease of wheat and other grains, or the parasitic fungus which causes that disease. The name B. is supposed to be a corruption of *burnt*, or at least derived from the same root, a derivation perhaps suggested by the analogy of *brand* (q.v.). B. is also called *pepper brand*, and sometimes *smut ball*. It is one of the most common and injurious diseases of wheat, often affecting great part of a crop, although its prevalence has been greatly diminished by care on the part of farmers, and particularly by the selection of clean seed, and the dressing of the seed, before sowing, with some substance, which, without injuring its vitality, destroys that of the spores or granules of the fungus. Even washing with water has a good effect, but greater benefit is derived from dressing with salt, quicklime, chloride of lime, Glauber's salt (sulphate of soda), and quicklime, or blue vitriol (sulphate of copper). Even arsenic and corrosive sublimate are used for this purpose. B. is now believed to be propagated by any contact of sound with unsound grain; by thrashing, which causes the B. dust to fly about; or by manure, in which the straw of infected grain has been mixed. Upon this knowledge, the means now adopted for its prevention are founded. A considerable mixture of B. is not supposed to render flour absolutely unwholesome, at least when made into fermented bread, but the bread is of a peculiar flavor, and a very dark color. It is said that such flour is used to no small extent in the manufacture of gingerbread, the treacle disguising both the color and the flavor.

BUNTER SANDSTEIN, or "variegated sandstone," is the lowest member of the triassic period. As the triass is more perfectly developed in Germany than in Britain, the German beds are considered the typical group of this period. The B. S. consists of various colored sandstones, interstratified with red marls and thin beds of limestone, which occasionally, as in the Harz, are oolitic, but in other places dolomitic. They attain a maximum thickness of 1500 feet. The English representatives of the B. S. are chiefly developed in Lancashire and Cheshire, and consist of red and mottled sandstones with beds of marl, and thick rather irregular bands of partially consolidated conglomerate called "pebble beds." Thirty species of fossil plants have been found in the B. S. near Strasburg, consisting chiefly of ferns, cycads, and conifers. But the most remarkable fossils in this formation are the remains of huge batrachians. Originally, the footprints which had been left by the animals on the moist sand were alone observed. From their resemblance to the impressions made by a human hand, the animal producing them was provisionally named *cheirotherium* (q.v.). The subsequent discovery and examination of the remains of teeth and bones in the same beds, have afforded sufficient materials to enable Owen to reconstruct an animal named by him *labyrinthodon* (q.v.), which undoubtedly produced the footprints. These remains have been detected in Lancashire and Cheshire, as well as in Germany.

BUNTINE, or Bunting, is a thin woolen material, of which the flags and signals of ships are usually made.

BUNTING, *Emberiza*, a genus of birds closely allied to finches and sparrows, and included with them by some ornithologists in the great family *fringillidæ* (q.v.), but by others made the type of a distinct family, *emberizidæ*, of which the most marked characteristics are a short, straight, conical bill, a curved form of the gape, produced by a narrowing of the sides of the upper mandible, and a corresponding enlargement of the under one, and a hard rounded knob on the palate or inner surface of the upper mandible. This knob probably aids in crushing the seeds, which are a principal part of the food of these birds. The species of the B. family are numerous, and are arranged in several genera. The true buntings (forming the restricted genus *emberiza*) have the hind claw moderately short, curved, and strong, and the palatal knob large and bony. The Common B. or Corn B. (*E. miliaria*)—a bird considerably larger than a house-sparrow, brown, with darker streaks on the upper parts, whitish brown, with spots and lines of

dark brown on the under parts, and with a slightly forked tail—is frequent, particularly in low cultivated grounds in Britain, and in most parts of Europe, extending also into Asia, living in pairs during spring and summer, but in flocks in winter, and often visiting barn-yards at that season, along with chaffinches and sparrows. It is the largest of the British buntings. It is supposed that the winter flocks in Britain are much increased by migration from more northerly regions. This B. often passes the night on the ground in stubble-fields, and is taken in the nets employed for catching larks, and brought with them to market. It usually builds its nest on or very near the ground. Its notes are harsh and unmusical.—The Reed B., or Black-headed B. (*E. shoeniclus*), is a species common in marshy situations, both in Britain and on the continent of Europe; a very pretty little bird, with black head and throat, strikingly contrasted with the white nape and sides of the neck.—The Cirl B. (*E. cirlus*), of which the head is olive-green, with black streaks, and with patches of bright lemon-yellow on the cheeks and over the eyes, is a rare British bird, and belongs chiefly to the s. of Europe and the n. of Africa. To this genus belong also the Ortolan (q.v.) and the Yellow-hammer (q.v.).—The Snow B. (q.v.), or Snowflake (*E. nivalis* of many authors), has been placed in the new genus *plectrophanes*. The name B. has been often very vaguely used, and many species have been almost indiscriminately called buntings or finches. The palatal knob affords the best distinctive character. North America has a number of species of bunting.—The Black-throated B. (*E. Americana*) is extremely plentiful on the prairies of Texas and other south-western parts of the United States; extending, however, as far as to Ohio, and even to Massachusetts. In the middle and northern states, it occurs only as a summer bird of passage. In its habits, it closely resembles the common B. of Europe; but the palatal knob is less hard.

BUNTING, Jabez, an eminent Wesleyan minister, was b. at Manchester in 1779. At the age of 20, he devoted himself to ministerial work, in which he was very successful. He was elected president of the annual conference in 1820, and again in 1828, 1836, 1844. In 1834, he was chosen president of the theological institution belonging to the Wesleyan Methodist body, and he acted as one of the secretaries to the missionary society in connection with his denomination, for a period of more than twenty years. He was the chief authority in all matters relating to the government and polity of Wesleyan Methodism. On his retirement from official life in 1857, his friends presented him with an annuity of £200, in consideration of the great services he had rendered to Methodism. He did not live, however, to profit by their kindness and forethought, having died in June, 1858.

BUNYAN, John, one of the most popular religious writers of any age, was b. at Elstow, near Bedford, in 1628. He was brought up to his father's trade of tinker, and spent his youth in the practice of that humble craft, of which his name alone now serves to lessen somewhat the disrepute. It has generally been taken for granted that his early life was very loose and profligate, on the sole ground of his terrible self-accusations in after-years, when, from the height of religious fervor and Puritan strictness, he looked back on dancing and bell-ringing as deadly sins. This point is satisfactorily disposed of by Macaulay (*Encycl. Britann.*, art. "Bunyan"). In his 16th or 17th year, he enlisted in the parliamentary army, and in 1645, was present at the siege of Leicester, where he escaped death by the substitution of a comrade in his place as sentry. Nothing further is known of his military career. After leaving the army, he married, and soon after began to be visited by those terrible compunctions of conscience, and fits of doubt, sometimes passing into despair, which, with some quieter intervals, made his life, for several years, a journey through that valley of humiliation of which he afterwards gave so vivid a picture. Hope and peace came at last, and in 1655, B. became a member of the Baptist congregation at Bedford. Soon after, he was chosen its pastor, and for five years ministered with extraordinary diligence and success, his preaching generally attracting great crowds. The act against conventicles, passed on the restoration, put a stop to his labors; he was convicted, and sentenced to perpetual banishment. In the mean time, he was committed to Bedford jail, where he spent the next 12 years of his life, supporting the wants of his wife and children by making tagged laces, and ministering to all posterity by writing the *Pilgrim's Progress*. His library consisted of a Bible and Fox's *Martyrs*. The kindly interposition of a high-church bishop, Dr. Barlow of Lincoln, at length released him, and he at once resumed his work as a preacher, itinerating throughout the country. After the issuing of James II.'s declaration for liberty of conscience, he again settled at Bedford, and ministered to the Baptist congregation in Mill lane till his death, at London, of fever, in 1688. B.'s whole works were published in 1736, in 2 vols. folio. The most popular of them, after the *Pilgrim's Progress*, are the *Holy War*—another allegory, much less successful—and *Grace Abounding to the Chief of Sinners*, an autobiographical narrative. It is supposed that no other book, except the Bible, has gone through so many editions, and attained to so wide a popularity, in all languages, as the *Pilgrim's Progress*. A fac-simile reprint of the original edition of the *Pilgrim's Progress* was published in 1875. A statue of B. was unveiled at Bedford in 1874.

BUNZLAU, a t. of Prussia, in the province of Silesia, is situated on the Bober, about 25 m. w.n.w. of Liegnitz. B. has manufactures of woolens, linens, hosiery, tobacco,

and earthenware, and a trade in grain. An obelisk to the Russian gen., Kutusow, who died here in 1813, adorns the market-place. Pop. '75, 9959.

BUNZLAU, JUNG, a t. of Bohemia, on the left bank of the Iser, about 32 m. n.e. of Prague. B. is well built, has an old eastle, and manufaetures of eotton, woolen, soap, leather, etc. It is said to owe its origin to king Boleslaf, who founded it in the 10th century. Pop. '69, 8695; '80, 9681.

BUNZLAU, JUNG or NEUE (*New Bunzlau*), a t. of Bohemia, on the left bank of the Iser, a tributary of the Elbe, 31 m. n.e. from Prague. It is well built of stone, has several churches, a Jewish synagogue, barracks, a hospital, a Piarist gymnasium, etc. It has manufactures of cotton and woolen fabrics, soap, and leather. It is said to have been founded by king Boleslaf in 973, and the fort built by him still exists. Its Bohemian name is *Mlada Boleslaw*. Pop. '80, 9681.

BUOL-SCHAUENSTEIN, KARL FERD., Count, Austrian statesman, was b. 17th May, 1797. After filling subordinate diplomatic posts, he became ambassador at Carlsruhe in 1828, afterwards at Stuttgart (1838) and at Turin (1844). Leaving Turin on the outbreak of the war in 1848, he went as ambassador to St. Petersburg, and it fell to him to uphold the interest and dignity of his country, on oecasion of the aid given by Russia in the Hungarian war. A not less diffieult task was assigned him when, in 1851, he was sent to represent Austria in London; his address and conciliatory bearing contributed not a little to bring about a more friendly feeling between the two governments. On Schwarzenberg's death, B. was reealled to Vienna, and became foreign minister. In this position, he earried out the new politics of Austria no less firmly and suceessfully, though more moderately and quietly, than his predeeessor. In the negotiations during and after the termination of the Crimean war, B. showed himself a skillful and able statesman. After defending with zeal and ingenuity, in diplomatic notes and circulars, the position whieh Austria had taken up with reference to Sardinia, B. suddenly, on the actual commeneement of the Italian campaign of 1859, resigned his plaee, which was immediately filled by count Reehberg. Failing health was the cause officially assigned for the step, but the general belief was, that it indicated a triumph of the war-party in the couneil of Franeis Joseph. He died Oet. 28, 1865.

BUONAFE'DE, APPIANO, 1716–93; an Italian philosopher and general of the Celestines; author of several works on philosophical themes.

BUONAROT'TI, MICHAEL ANGELO. See MICHAEL ANGELO, *ante*.

BUOY is a floating body, intended as a mark for the guidanee of mariners. It is made either of wood or metal, and is mostly hollow, to make it float better. Buoys are generally moored by chains to the bed of the river or channel. They are of various shapes and sizes, and are painted of various colors, partly to render them conspicuous, and partly to distinguish them one from another. Sometimes floating buoys mark out the best ehannel for entering a doek; sometimes they warn the mariner away from sands, spits, and shoals; sometimes they mark out a continuous double line, as at Spithead, between which ships can alone with safety enter a harbor. The Trinity house has adopted a form of B., invented by Mr. Herbert, in which, by due attention the eenter of flotation, and to the point where the mooring-ehain is fixed, the tendeney to piteh and roll is mueh lessened, and the B. kept nearly upright in all weathers. Messrs. Brown and Lenox's *bell-buoy* is an ingenious contrivance for rendering a B. audible, whether it is visible or not; so long as any stream of water, whether caused by a tide or a current, passes through the lower part of the B., it moves an undershot water-wheel, which rings a bell.

The lighting of coast-buoys by means of compressed gas has been of late successfully attempted. Experiment proved that buoys 5 ft. by 3 ft. could contain enough of gas (made from shale-oil refuse or the like) to keep up a brilliant light for a month or more at a time.

BUOYANCY, of ships, is the amount of weight which can be buoyed up by the huil. The B. of a vessel is proportionate to the weight of water displayed by its presence (see HYDROSTATICS), and is found in this way: The cubie feet of the part of a vessel to be immersed being known, multiply it by the weight of a cubic foot of water (62.5 lbs.), and the product will be the weight of water displaced. From this subtract the weight of the vessel, and the result will be the B. or the weight a vessel will carry without sinking lower than the given line. It is admitted, however, by naval arehitects, that all the old rules concerning B., displacement, and flotation, must undergo modification by the introduetion of iron ships, paddle and serew propulsion, and the increased weight of broadside.

BUOY-DUES. Buoys are under very stringent regulations, on account of their importance to the safety of ships. The public buoys. for guiding into channels, and warning from shoals and rocks, are usually marked on the best charts relating to that particular water-way. The corporation of the Trinity house has a peeuliar jurisdietion over the buoys and beacons in the Thames, and along the Essex and Suffolk eoasts; as well as on other coasts in England and Wales. All ships which enter the ports within this jurisdiction pay a small sum as buoy-dues. The payment is sometimes a tonnage rate, varying from $0\frac{1}{8}d.$ to $2d.$ per ton; sometimes a rate per vessel, varying from $4d.$ to $3s.$; some-

times a payment on entering only, at others on departure as well as on entering; while some kinds of coasting vessels pay 5*s.* per annum, whatever may be the number of voyages. From the Thames buoys alone, the Trinity house receives £14,000 per annum as dues.

BUPALUS AND ATHENIS, Greek sculptors, 540 B.C., in the isle of Chios. They were brothers, and sons of Anthermus, also a sculptor. As they produced only draped figures, it is inferred that the art had not advanced so far as to attempt nude subjects. It is said that B. made a caricature of the poet Hipponax, who was naturally intensely ugly, and that the poet retorted by verses that drove the sculptor to suicide.

BU'PHAGA. See BEEFEATER.

BUPHONIA, or DIIPOLIA, a religious festival held in Athens on the 14th July, when the very old ceremony of sacrificing an ox to Zeus was observed.

BUPRES'TIS, a Linnæan genus of coleopterous (q.v.) insects, now divided into a number of genera, and forming a tribe or family, *buprestidæ*, of which some hundreds of species are known, most of them belonging to tropical countries, and remarkable for the splendor of their colors. The colors are generally metallic in their luster, have frequently a burnished appearance, and are often beautifully iridescent. One of the largest species, *B. gigas*, is a native of Cayenne: it is about 2 in. long. The English and other European species are all comparatively small. Most of the species spend the night on trees, shrubs, and other plants, flying about during the hottest part of the day. Some of them are popularly known as GOLDEN BEETLES. Plants are sometimes seen studded with them in the morning, as with gorgeous flowers. The golden *elytra* (wing-cases, see ELYTRA) of some species are used to enrich the embroidery of the Indian zenana; and the lustrous joints of the legs are strung on silken threads, and form necklaces and bracelets of singular brilliancy. The species of *buprestidæ* found in England are few; none have yet been found in Scotland. The larvæ seem sometimes to be transported from one country to another in timber.

BUR, in an engraving, is a slight ridge of metal raised on the edges of a line by the *graver or the dry point.* As the B. produces an effect like a smear, it is usually regarded as a defect, and scraped off. Some etchers, however, take advantage of it to deepen their shadows, and Rembrandt made use of it in this way with telling effect.

BURANHEM, or BURUNHEM. See MONESIA BARK.

BURA'NO, an island and t. of northern Italy, in the Adriatic, about 5 m. n.e. of Venice. The island supplies a large proportion of the vegetables consumed in Venice. B. has some lace-manufactures, boat-building, and an extensive ropework, but the inhabitants are chiefly employed in fishing. Population of town, 5000; of commune, 7000.

BURBAGE, or BURBADGE, RICHARD, d. 1619; an English actor, son of James, also an actor. Richard was the first person to receive license as a player (1574), and was for many years a business and professional associate of Shakespeare, acting "Richard III.," "Proteus," and other leading characters.

BUR'BOT, *Lota vulgaris*, a fish of the same genus with the ling (q.v.), and of the same family with the cod, haddock, etc., being the only British fresh-water species of that family, *gadidæ*. It is found in the Cam, the Trent, and other rivers of the eastern and midland counties of England, but is one of the most local of British fresh-water fishes. It is found also in various parts of the n. of Europe, and at least as far s. as Switzerland; in Siberia and other parts of Asia, even, it is said, in India. In English rivers, it often reaches 2 or 3 lbs. in weight, but has been taken of 8 lbs. weight; and in some parts of Europe, it is said to reach 10 or 12 lbs. weight. In appearance, the B. very much resembles the ling, but is rather thicker at the neck, and tapers rather more rapidly, although still of a somewhat elongated form. It has two dorsal fins, the first short, the second very long, and a very long anal fin. It differs from the ling in the form of the tail-fin, which is oval and slightly pointed; but agrees with it in having a single barbule on the lower jaw. It is of a yellowish-brown color, clouded and spotted with darker brown on the upper parts, the under parts lighter; the scales are small; and the whole body is covered with a mucous secretion. The flesh is white, firm, and of good flavor; "and as the B. is in its nature extremely hardy, few difficulties present themselves in the way of their increase in quantity, while the value of the fish would amply repay the trouble or the cost of the experiment."—*Yarrell.* The B. is capable of living for a long time out of water. It is commonly taken by trimmers and night-lines, as it feeds principally during the night. Its food consists of small fishes, worms, mollusca, etc. Its liver yields an oil similar to cod-liver oil.

BURBRIDGE, STEPHEN GANO, b. Ky., 1831; bred to the law, but engaged in mercantile business and farming. When the war of the secession began, he entered the union service, and was distinguished for bravery in many engagements. He resigned after the close of the war, with the rank of brevet brig.gen.

BURCHARD, SAMUEL D., D.D. See page 882.

BURCKHARDT, JOHN LEWIS, an enterprising African traveler, was b. at Lausanne, in Switzerland, Nov. 24, 1784. In 1806, he came to London, and was introduced by sir Joseph Banks to the African association, which accepted his services to explore the

route of Hornemann into the interior of Africa, and he embarked for Malta, Feb. 14, 1809. He had previously qualified himself for the undertaking by a study of Arabic, and also by inuring himself to hunger, thirst, and exposure. From Malta he proceeded, under the disguise of an oriental dress and name, to Aleppo, where he studied about two years, at the end of which time he had become so proficient in the vulgar Arabic, that he could safely travel in the disguise of an oriental merchant. He visited Palmyra, Damascus, Lebanon, and other remarkable places, and then went to Cairo, his object being to proceed from thence to Fezzan, and then across the Sahara to Sudan. No opportunity offering itself at the time for that journey, he went into Nubia. No European traveler had before passed the Derr. In 1814, he traveled through the Nubian desert to the shore of the Red sea and to Jeddah, whence he proceeded to Meeca, to study Islamism at its source. After staying four months in Meeca, he departed on a pilgrimage to Mt. Arafat. So completely had he acquired the language and ideas of his fellow-pilgrims, that, when some doubt arose respecting his Mohammedan orthodoxy, he was thoroughly examined in the Koran, and was not only accepted as a true believer, but also highly commended as a great Moslem scholar. In 1815, he returned to Cairo, and in the following year ascended Mt. Sinai. The Fezzan caravan, for which he had waited so long, was at last about to depart, and B. had made all his preparations for accompanying it, when he was seized with dysentery at Cairo, which terminated his life in a few days, Oct. 15, 1817, at the early age of 33. As a holy *sheik*, he was interred with all funeral honors by the Turks in the Moslem burial-ground. His collection of oriental MSS., in 350 volumes, was left to the university of Cambridge. His journals of travel, remarkable alike for their interest and evident truthfulness, were published by the African association. B. was a man born to be a traveler and discoverer; his inherent love of adventure was accompanied by an observant power of the highest order. His personal character recommended him to all with whom he came in contact, and his loss was greatly deplored, not only in England, but in Europe. His works are—*Travels in Nubia*, 1819; *Travels in Syria and the Holy Land*, 1822; *Travels in Arabia*, 1829; *Notes on the Bedouins and Wahabis*, 1830; and *Manners and Customs of the Modern Egyptians*, 1830.

BURDEKIN, a river in n.e. Australia, in the colony of Queensland, about 350 m. long, falling into Upstart bay.

BUR'DEN, a term of law in Scotland, used to signify any restriction, limitation, or incumbrance affecting either person or property. Burdens are said to be either personal or real. Where a party is taken bound by acceptance of a right to pay a certain sum to another, but where there is no clause charging the subject conveyed with the sum, the burden is said to be *personal;* that is, it will be binding upon the receiver and his representatives, but will constitute no real incumbrance on the lands, or other subject conveyed, nor amount, indeed, to anything more than a mere personal obligation on the granter. But where the right is expressly granted under the burden of a specific sum, which is declared a burden or charge on the lands themselves, or where the right is declared null if the sum be not paid, the burden is said to be *real.*

By the 10 and 11 Vict. c. 48, real burdens need not be inserted in full in conveyances, if they have already been set forth in an instrument of title, in which case they may be referred to in the terms, or as nearly as may be in the terms, set forth in schedule C. annexed to the act. A similar provision is made in regard to lands held in burgage tenure, by the 10 and 11 Vict. c. 49.

BUR'DEN, or BUR'THEN, of a ship. See TONNAGE.

BURDEN, HENRY, 1791–1871; b. Scotland; son of a farmer; came to the United States in 1819, and the next year made the first cultivator used in agriculture in this country. His inventions include improvements in plows, a machine for making iron spikes, and one for fashioning horseshoes which produced 60 shoes per minute from the bar. He was agent and afterwards proprietor of the Troy iron and nail works, one of the largest manufactories in the world. He devoted much attention to steam navigation, and built, in 1833, a steamboat which from its shape was called the "cigar boat," but it was lost before its speed had been fairly tried.

***BURDEN OF PROOF**, in legal procedure, signifies the obligation to establish by evidence certain disputed facts; and, as a general rule, this burden lies on the party asserting the affirmative of the issue to be tried or question in dispute, according to the maxim *ei incumbit probatio qui dicit non qui negat*—that is, proof is incumbent on him who asserts, not on him who denies. The principle of the law is, that the B. of P. is on the party who would fail if no evidence were adduced on either side. Accordingly, it almost always rests on the plaintiff in an action, or on the party asserting the facts on which the result of the litigation must depend. In one case tried before the late baron Alderson, that learned judge laid down that the proper test was, *which party would be successful, if no evidence at all were given?* the B. of P., of course, falling on the party not in that position. This test has since been generally adopted and applied; but Mr. Best, in his learned work on the *Principles of Evidence*, improves on it by the suggestion, that in strict accuracy the test ought to be, "which party would be successful, if no evidence at all, *or no more evidence*, as the case may be, were given?" a consideration on which the discretion and judg-

ment of counsel frequently depend. But although such, in general, is the position of the plaintiff, it sometimes happens that the B. of P. is imposed on the defendant, and in consequence of his having the affirmative of the material issue to be tried.

It is this rule as to the B. of P. that demonstrates the real nature of the plea of *not guilty* in a criminal prosecution, and which divests that plea of the objections to it which are frequently heard expressed by overserupulous sentimentalists; for the meaning of that plea is not necessarily an assertion by the prisoner that he is absolutely guiltless or innocent, but that he wishes to be tried, and that as the B. of P. is on the prosecutor, while he has meanwhile the presumption of innoeence in his favor.—Besides the work referred to, see on the subject of this artiele Starkie on the *Law of Evidence in England,* and Dickson on the same subject in Seotland. See *Supp.*, page 883.

BURDENS, Public. See Public Burdens.

BURDER, Rev. George, an active and influential minister of the Congregational body, was b. in London, June, 1752. After studying some time as an artist, he devoted himself to the ministry, and in 1778 was appointed pastor of an independent church at Lancaster. He afterwards removed to Coventry, and in 1803 to London. Here he became secretary to the London missionary society, and editor of the *Evangelical Magazine,* the duties of which offiees he discharged with great zeal, until failing health compelled him to resign. B. took a prominent part in all the religious movements of his time. He died May, 1832. His *Village Sermons* have been translated into several European languages; and he was the author of other series of sermons and publieations which have had an immense circulation.

BURDETT, Sir Francis, Bart., the most popular English politician of his time, b. Jan. 25, 1770. Educated at Westminster school and Oxford university, he spent some years on the continent, and was a witness to the progress of the first French revolution. In 1793, he married Sophia, youngest daughter of Thomas Coutts, esq., the wealthy London banker, and in 1796 was elected M. P. for Boroughbridge, Yorkshire. In 1797, on the death of his grandfather, he succeeded to the baronetcy. In the house of commons, he made himself conspicuous by his opposition to government and the war, and his advocacy of parliamentary reform, Catholic emancipation, and other liberal measures, most of which were afterwards carried. One of the most effeetive political speakers of that excited period, he for many years prominently oecupied public attention, and was the idol of the London populace. Having succeeded in obtaining a parliamentary inquiry into the abuses of the metropolitan prisons, he became, in 1802, a candidate for Middlesex. He was first returned, then unseated, and after a second contest, defeated. At the general election of 1806, B. again became a candidate for Middlesex, but was defeated. In May, 1807, he fought a duel with Mr. James Paull, one of the candidates for Westminster the previous year. Soon after, he was returned, with lord Coehrane, for Westminster, which he represented for nearly 30 years. B. having in 1810 published, in Cobbett's *Political Register*, a letter to his constituents, declaring the conduct of the house of commons illegal in imprisoning John Gale Jones, the speaker's warrant was issued for his apprehension, as being guilty of a breach of privilege. Refusing to surrender, he for two days barricaded his house; the populace supported him in his resistance, and in a street contest between them and the military some lives were lost; but on April 9, the sergeant-at-arms, aided by the poliee and military, obtained an entrance, and conveyed him to the Tower. The prorogation of parliament restored him to liberty. Prosecuted in 1819 for a libel contained in a letter to his constituents, strongly animadverting on the proceedings of the magistrates and yeomanry at the memorable Manchester meeting, he was sentenced to three months' imprisonment in the king's bench, and to pay a fine of £1000. In 1835, he deserted the liberal party, and joined the conservatives. In 1837, he was returned for Wiltshire. He died in 1844.

BURDETT-COUTTS, The Right Hon. Angela Georgina, Baroness, daughter of sir Francis Burdett, was b. in 1814. In 1837, she inherited much of the property of her grandfather, Thomas Coutts, the banker, on the death of his widow, who died duchess of St. Albans. The liberal and public-spirited use she has made of this wealth, in her efforts to mitigate the sufferings of her fellow-creatures and the lower animals, has rendered her name well known and deservedly popular. Besides spending large sums of money in building and endowing several churches and schools, she endowed the three colonial bishoprics of Cape Town, Adelaide, and British Columbia, at an outlay of about £50,000, and founded an establishment in South Australia for the improvement of the aborigines. In her zeal for the good of her own sex, she effected important reforms in the teaching of girls at the national schools, and established a shelter and reformatory for fallen women. To the city of London she has presented, besides several handsome fountains, the Columbia market, Bethnal green, for the supply of good and wholesome food in a poor district. She also built Columbia square, consisting of model dwellings at low rents, for about 300 families; and, taking great interest in emigration, has assisted many poor families in their passage and outfit. Her private charities have been on a corresponding scale; and she is also a liberal patroness of art. In 1871, she accepted a peerage from government, with the above title. In 1872, the freedom of

the city of London was conferred upon her (the first woman who ever received it); and in 1874 she received the same honor from Edinburgh. She m. Mr. Ashmead-Bartlett, 1881.

BURDETTE, Robert Jones. See page 883.

BUR'DOCK, *Arctium*, a genus of plants of the great natural order *compositæ* (q.v.), tribe *cynarocephalæ*. The heads of flowers are globose, or nearly so; and each of the scales of the involucre runs out into a long rigid prickle, which is hooked at the point. By means of these hooks, the flower-head, popularly called a *burr*, readily lays hold of the clothes of a passer-by, the wool of a sheep, or the like, and thus the seeds are transported from one place to another, the short hairy pappus being insufficient to waft them far on the wind. The common B. (*A. lappa*), of which varieties very slightly distinguished have sometimes been described as species (*A. bardana*, etc.), is abundant in waste and bushy places, by waysides, etc., in Britain and throughout Europe, scarcely, however, growing except in rich land. Its root is biennial, large, and fleshy, somewhat carrot-shaped; the root-leaves large, stalked, heart-shaped; the stem stiff, upright, somewhat branched and leafy, 3 ft. or more high. The whole aspect of the plant is coarse, and it is somewhat clammy to the touch. The root is sometimes used in medicine, being diaphoretic and diuretic, and acting upon the cutaneous system and the kidneys. It is capable of being made a substitute for sarsaparilla. When fresh, it has a disagreeable smell, but when dry it is inodorous; it has a sweetish mucilaginous taste, becoming afterwards bitterish and rather acrid, and contains chiefly inulin, bitter extractive, mucilage sugar, and a little tannin. In many countries, the roots, young shoots, and young leaves of B. are used in soups; and the plant is cultivated for this use in Japan. The roots are said to resemble artichokes in taste. The leaves and their expressed juice are sometimes applied to burns and suppurations.

BURDWAN', a city in the district and province of the same name, in the government of Bengal, on the Grand Trunk road from the Hoogly to the n.w. provinces, in lat. 23° 12′ n., and long. 87° 56′ e., 74 m. from Calcutta, with which it is connected by railway. In point of architecture, it is a miserable place—an aggregate, as it were, of second-rate suburbs. Pop. '71, 32,321.

BURDWAN', the district of the last-mentioned city, lying between Beerbhoom on the n., and Hoogly on the south. It stretches in n. lat. from 22° 52′ to 23° 40′, and in e. long. from 87° 21′ to 88° 23′. It has an area of 3523 sq.m., with (1871) 2,034,745 inhabitants, or 577 to the sq.m.—a proportion which certainly seems to justify a name that signifies *productive*. The district is largely engaged in the refining of sugar. It exports also iron and coal; chiefly, however, brought from the mines of Bancoorah, the district on the west. Next to the capital, Cutwa and Culna are the chief towns.—The *division* of B. has an area of 12,719 sq.m., and a pop. (1871) of 7,286,957.

BURE, or Bur, a mythical being who stands in Norse mythology as the grandfather of Odin, the supreme deity in that religion. The larger portion of Snorro Sturleson's work known as the *Younger* or *Prose Edda* (in distinction from the poetical or *Elder Edda*) is devoted to the *Fooling of Gylfi*, and these two older and younger Eddas correspond in that old heathen religion very nearly to the old and new testaments in Christianity. It is not in place here to tell all the strange adventures of Gylfi in his search for the origin of things, but only so far as concerns Bure. Gylfi (who was a king of Svithiod, or Sweden) journeyed to Asgard (the home of the gods) in search of knowledge, and the gods, knowing of his coming and his purpose, were ready to answer him. After he had been satisfied about the gods, their number and attributes, Gylfi asked about their origin. He was told that, many ages before the earth was made, Niflheim (the nebulous or shadowy region) was formed; that in the middle of Niflheim was a spring called Hvergelnur (the roaring cauldron), from which twelve rivers flowed. When the rivers had flowed far from their sources the venom which they rolled along hardened, as does the dross that runs from a furnace, and became ice. The ice stood still, and the vapor that gathered over it froze into rime, or frosty-snow, and in this manner were formed in Ginnunga-Gap (the yawning abyss, or all space) many layers of congealed vapor, piled one upon another. But the southern part of Ginnunga-Gap was filled with sparks and flashes of fire that flew into it from Mushellheim (the home of elemental fire). In the conflict of elements the rime was melted and the melted drops took a human semblance, and the being thus formed was named Ymir (the primordial giant). Another creature formed from this conflict of heat and cold was a cow named Audhumla (darkness), and from her teats ran four streams of milk, on which Ymir was fed. "But," asked Gylfi, "on what did the cow feed?" The answer was that she supported herself by licking the surrounding stones, which were covered with hoar-frost and salt. The first day she licked there appeared the hair of a man; the second day the head came to view; and the third day the whole man appeared. This man was called Bur or Bure ("born," whence old German "barn," and Scottish "bairn," a child). This first creature in the form of a man was the father of Bör (also meaning born), who took for his wife Besla, the daughter of the giant Bolthorn (calamity or evil), and this pair were the parents of Odin, the Norse allfather, and his brothers Veli and Ve. No wife is named for Bure, nor is anything further related of him.

BUREAU, a French word signifying a writing table or desk; also, an office for transacting business, a department of government or the officials that carry it on. Bureau-

CRACY is popularly applied to signify the kind of government, exemplified in many continental states, where a host of government officials, regularly organized and subordinated, and responsible only to their chiefs, interfere with and control every detail of public and private life—the evil which the Germans call "much-government" (*vielregieren*).

BUREAU, a co. in n.w. Illinois on the Illinois river; 800 sq.m.; pop. '80, 33,189; level and fertile, with little timber; the chief business is agriculture. It is intersected by the Chicago and Rock Island and other railroads. Co. seat, Princeton.

BUREN, MARTIN VAN, a president of the United States of America (1837–41), was b. at Kinderhook, in Columbia, N. Y., Dec. 5, 1782. Educated for the bar, he was elected, in 1812, senator in the legislative assembly of New York, and in 1821 took his seat in congress, where he supported democratic measures. In 1829 he was made secretary of state, and in 1837 he succeeded gen. Jackson in the presidency, being elected by a majority of 24 votes over his rivals, Clay, Webster, and Harrison. On beginning the duties of his office, he found himself involved in such financial perplexities, that he immediately summoned congress to an extraordinary session, and proposed an entire separation of state-finance from the banks of the union, a proposition which was decisively rejected, and B.'s popularity was greatly damaged. In 1840, he had to yield his place to gen. Harrison, the Whig candidate; and in 1844, when he again stood for the presidency, he was defeated by Polk. The result of this vote divided the democrats into two parties, one of which, at a convention at Utica, unanimously declared for Van B. as president for 1848; but his election was prevented by the military renown of gen. Taylor, who left both Van B. and Cass with minorities. In 1856, he was again named for the presidency; but the majority of the democratic party preferred Mr. Buchanan. He died July, 1862.

BURG, a t. of Prussia, in the province of Saxony, situated on the Ihle, about 13 m. n.e. of Madgeburg. It is walled, and has long been famous for its extensive woolen manufactures. It has also manufactures of linen, yarn, steel, pottery, and leather; dyeworks, distilleries, foundries, etc., and a large trade in agricultural produce. Pop. '75, 15,262.

BURGAGE TENURE is a species of holding in the law of real property which prevailed both in England and Scotland, although somewhat differently regarded in these two countries. In England, it is a species of free *socage* (q.v.) holding, and it prevails where the king or other person is lord of an ancient borough in which the tenements are held by a certain and determinate rent, and subject to a variety of customs, the principal and most remarkable of which is that called *Borough English* (q.v.). Among the other customs was a law that the wife shall be endowed with all her husband's tenements, and not with the third part only, as at common law.

In Scotland, by this tenure is meant a peculiar sort of military holding affecting property in royal burghs, the sovereign being superior or over-lord, and each individual proprietor or burgess holding direct of the crown, for the *reddendo* or service of *watching and warding* (q.v.). This service is otherwise termed "service of burgh used and wont," and is now merely nominal. Although the burgesses hold immediately of the crown, they do not receive their formal entry directly from the sovereign, but from the magistrates of the burgh, as the crown's commissioners. If the burgh, as such, ceases to exist, the crown does not thereby lose its rights over the proprietors, for they continue as crown vassals (q.v.). The statutes 31 and 32 Vict. c. 101, and 32 and 33 Vict. c. 116, abolished many useless forms in this tenure. See TENURE OF LAND.

BURGAS, or BURGHAZ, a t. of Turkey, in the province of Eastern Roumelia, on a promontory in the Black sea, about 76 m. n.e. of Adrianople. B., which is well built and clean, has manufactures of pottery of a superior kind, and a good trade in agricultural produce. Pop. about 6000. The gulf of Burgas, at the head of which the town is situated, is about 14 m. in length, and has a depth varying from 5 to 12 fathoms.

BURGDORF (Fr. BERTHOUD), a t. in Switzerland, on the Emme, 14 m. from Bern. It is over 1800 ft. above sea level, and consists of a lower and an upper part, which are connected by spiral streets. There are an ancient castle, a town-house, hospital, library, etc.; also ribbon, tobacco, and chocolate manufactories, and a large trade in dairy products. In 1384 the town and countship were purchased by Berne for 37,000 florins, and the Bernese magistrates held rule until 1798. Pestalozzi had his school in the castle for a number of years. Pop. '70, 5078.

BUR'GEO ISLANDS, belonging to England, and lying between Newfoundland and cape Breton, in lat. 47° 33′ n., and long. 57° 44′ west. Besides being valuable as a fishing-station, they occupy a commanding position with respect to British North America in general, and the gulf of St. Lawrence in particular. The group has 700 inhabitants.

BÜRGER, GOTTFRIED AUGUST, one of the most popular German poets, was b. Jan. 1, 1748, at Molmerswende, near Halberstadt, in Prussian Saxony. In his boyhood, he displayed no capacity for hard study, and was particularly averse to Latin; but he at the same time showed a relish for verse, though destitute of any other model than the Psalm-book. In 1764, he went to Halle, and applied himself to theology. In 1768, he abandoned this science for jurisprudence, which he studied at Göttingen. Here his conduct

was careless and immoral, and he would probably have sunk into obscurity, if the intimacy which he happily formed with Voss, the two Stolbergs, and other young poets, had not stirred up his better nature, and inspired him with an earnest ambition to excel. He labored hard at the classics of ancient and modern times, but the study of Shakespeare and Percy's *Reliques* had the greatest influence in deciding the style of poetry which he was to adopt. With regard to the intrinsic merits of his poems, which consist chiefly of ballads and songs, even German critics—such as Schiller, Gervinus, and Vilmar—differ widely in their opinions; but all agree in praising the popular style and fluent, spirited versification of his ballads, *Leonora*, *Lenardo and Blandine*, the *Parson's Daughter of Taubenhayn*, the *Wild Huntsman*, etc. B.'s life was spent in great poverty and misery, partly the result of misfortune, and partly induced by his own errors. He married thrice, in two instances very unhappily; lost his property by an unfortunate speculation; and, though the favorite poet of the German people, was left to earn his bread by translations and similar literary labors. He died June 8, 1794. Though a popular writer, B. was very careful as to style, and was one of the first who wrote good hexameter verse in German. Since 1798, there have been numerous complete and partial editions of his works. See B.'s life by Döring (1826), and by Pröhle (1856).

BURGERS, Thomas François. See page 883.

BÜR'GERMEISTER, the German title of the chief magistrate of a city or town, analogous to the French *maire*, the English *mayor*, and the Scotch *provost*.

BURGERSDYK, or BURGERSDICIUS, Francis; a Dutch logician, 1590–1629. He was professor of logic and moral philosophy, and afterwards of natural philosophy, at Leyden. His *Logic* was a valuable work; *Idea Philosophiæ Moralis* was a posthumous publication.

BURGES, Tristam, ll.d., 1770–1853; b. Mass.; a lawyer, and head of the Rhode Island bar; in 1815, chief justice of the state. In 1816, he was professor of oratory in Brown university; in 1825, elected to congress, where he served ten years. He was a ready, witty, and sarcastic speaker, and had many sharp discussions with the equally ready and sarcastic John Randolph. In 1839, he published *The Battle of Lake Erie, with Notices of Commodore Elliott's Conduct.*

BUR'GESS, or Burgh'er, from the same origin as borough, means, when taken in a general sense, much the same thing as the word citizen, but has a variety of special meanings, according to local institutions. In French literature, the word *bourgeois* is generally used to personify the excess of plebeian vulgarity; while, on the other hand, in England, the aristocratic member of parliament for a city is technically called a burgess. In almost all parts of Europe, when used in a technical sense, the word means a person who holds some peculiar privilege in a town or municipal corporation. The burgesses of the European towns, indeed, were, and still nominally are, an interesting relic of ancient Roman institutions, existing in contest and rivalry with the institutions of feudality. The B., with a different name, is virtually the civis or citizen of the Roman municipality. It was a rank always of some moment, but especially valuable when the citizenship was of Rome, the metropolis. St. Paul, when he was to be scourged, raised the alarm of the chief captain by stating that he was a Roman. Such an event might often have happened in the middle ages, when a B., brought before the court of a feudal lord claimed the privilege of pleading in his own burgal court, or the king's tribunal. The European monarchs found it their interest to support the burgesses, as a check on the influence of the feudal aristocracy; and thus was nourished the great system of city communities, which have exercised so important an influence on the fate of the world. See Municipality.

In the law of England, a B. is a member of the corporation of a corporate town, or he may be described as a freeman duly admitted as a member of the corporate body. This privilege was, and, to some extent, still is, acquired by birth or servitude—that is, by being born of a freeman, or by apprenticeship for seven years within the borough to a freeman. It might also be obtained by gift or purchase; and the municipal corporation act, the 5 and 6 Will. IV. c. 76—with the exception of abolishing the last-mentioned mode of admission by gift or purchase—expressly reserves the rights of such freemen and their families; and it also provides for the making up and preservation of a list of burgesses so admitted, to be called the *freeman's roll* (q.v.). In that act, a burgess is defined to be a male person, who, on the last day of Aug. in any year, shall have occupied any house, warehouse, counting-house, or shop within the borough, during that year and the whole of the two preceding years; and during such occupation shall also have been an inhabitant householder within the borough, or within seven miles thereof. As the law now stands, every person of full age (and this includes females) who on the last day of July shall have occupied any house, warehouse, counting-house, shop, or other building within the borough during the whole of the preceding twelve months, and also shall have resided within seven miles of the borough, shall, if duly enrolled, be a burgess and member of the body corporate of the mayor, aldermen, and burgesses of such borough, provided he shall have paid his borough rates up to the preceding Jan., and shall not have been in receipt of parochial relief. The premises occupied need not be the same throughout the year if they are within the borough, 35 and 36 Vict. c. 55. See Town Council. The vote is by ballot.

In the Scotch law, the old definition of B. is still maintained. This is very similar

to the old English one above mentioned, with the addition of admission to the privilege *by election of the magistrates of the borough*—the burgesses taking, on the occasion of their admission, a quaint form of oath, in which they confess the religion of the country, loyalty to the queen, to the provost and bailies of the burgh and their officers, and declaring *inter alia*, that they will "make concord where discord is, to the utmost of their power." By the Scotch municipal reform act, 3 and 4 Will. IV. c. 76, s. 14, it was enacted that councilors must be entered burgesses of the burgh before their induction, but now, any councilor is at once made a B. by minute of council. One of the peculiar privileges of a B. in Scotland, that of his heir having a right to *heirship movables*, was abolished by the statute 31 and 32 Vict. c. 101, s. 160, titles to land (Scotland) act. An act assimilating the law of Scotland to that of England respecting the creation of Burgesses was passed in 1876.

BURGESS, Alexander, D.D. See page 883.

BURGESS, Daniel, D.D., 1645–1712; an English dissenting divine, who openly avowed Presbyterian principles, and, in Ireland, frequently preached in defiance of the severe laws against non-conformity. He was imprisoned, and upon release went to London, where he soon gathered a large congregation by ardent zeal and the witty and ludicrous illustrations he used in his sermons. He was tutor of Henry St. John, afterwards lord Bolingbroke.

BURGESS, George, D.D., 1809–66; b. R. I.; graduate of Brown university and tutor therein, afterwards studying in Germany. In 1834, he was rector of an Episcopal church in Hartford, Conn., and in 1847 became bishop of Maine, officiating also as rector of a church in Gardiner. He published *The Last Enemy Conquering and Conquered; Sermons on the Christian Life;* and a metrical version of a portion of the Psalms.

BURGESS LIST and **BURGESS ROLL** are lists made under the provisions of the municipal corporation act, 5 and 6 Will. IV. c. 76, amended by 20 and 21 Vict. c. 50, and 32 and 33 Vict. c. 55. The overseers of the poor of every parish wholly or in part within any borough, are directed to make out an alphabetical list, called the *burgess list*, of all persons who may be entitled or qualified to be enrolled on the burgess roll of that year, such list to be open for perusal by any person, without the payment of any fee, at all reasonable hours, between the 1st (when the list must be signed and delivered) and 15th days of Sept. in every year. This list is afterwards revised by the revising barrister, and the names of those persons allowed, on revision, to remain, are then transferred to the *burgess roll*, which is copied into a general alphabetical list in a book provided for that purpose by the town-clerk or clerk of the peace, and which book must be completed on or before the 22d of Oct. in every year; every such book being the burgess roll of the burgesses entitled to vote for councilors, assessors, and auditors of the borough. Copies of such burgess roll, so completed, shall be made in writing, or printed, for delivery and sale to all persons applying for the same, on payment of a reasonable price for each copy. There are other regulations respecting these lists, and with respect to neglect and informality in making up the burgess roll. Every person of full age, who occupies a house, warehouse, counting-house, shop, or other building within the borough for twelve months, and resident in or within seven miles, shall, if duly enrolled, be a burgess, 32 and 33 Vict. c. 55.

In regard to Scotland, it has been already explained (see Burgess), that persons entitled to the privileges of burgesses must be admitted according to the old form, and councilors, before induction, may, by a minute of council, be made burgesses, 23 and 24 Vict. c. 47. But the list, which corresponds to the English burgess roll, is the list of municipal *electors* qualified according to the provisions of the 3 and 4 Will. IV. cc. 76, 77; 31 and 32 Vict. c. 108; and 33 and 34 Vict. c. 92, relating to royal burghs in Scotland.

BURGH is a descriptive name of towns and cities in Scotland, corresponding to the English word *borough* (q.v.). There were *burghs of barony*, *free burghs*, *burghs of regality*, and *royal burghs*. Since 1832, there have been what are called *parliamentary burghs*—that is, towns or burghs not being royal burghs, but sending or contributing to send representatives to parliament, under the act 2 and 3 Will. IV. c. 65. By the general police act for Scotland, the word B. was declared to mean also any populous place, the boudaries of which are fixed by the act. Among parliamentary burghs are Paisley, Greenock, Leith, Kilmarnock, Falkirk, Hamilton, Peterhead, etc.; and by the 3 and 4 Will. IV. c. 77, 15 and 16 Vict. c. 32, 16 and 17 Vict. c. 26, 31 and 32 Vict. c. 108, 33 and 34 Vict. c. 92, 35 and 36 Vict. c. 33, a code is given for the election of their magistrates and councilors, and for the appointment of other officers; the election being with the persons qualified to vote for a member of parliament—to be concluded in Paisley, Greenock, Leith, and Kilmarnock, by open poll in one day, the polling-books to be summed up, and the result declared by the provost: in Falkirk, Hamilton, Musselburgh, Airdrie, Port-Glasgow, Peterhead, Portobello, Cromarty, and Oban, to be by signed lists: a third of the council to go out, and others to be elected every year; and the provost and magistrates to be chosen by the council from their own number.

The police of burghs, and everything regarding their draining, cleaning, lighting, etc., are regulated by the police (Scotland) act, 20 and 21 Vict. c. 72, and the public health (Scotland) act, 30 and 31 Vict. c. 101.

Burghs of Barony are corporations consisting of the inhabitants of determinate tracts of ground within the *barony* (q.v.), and municipally governed by magistrates, whose election is either dependent on the baron or lord of the district, or vested in the inhabitants themselves. Sometimes their charter of incorporation gave them power to create subordinate corporations and crafts, as in royal burghs; but all exclusive privileges of trading in burghs are abolished by the 9 and 10 Vict. c. 17. In other respects, the general corporate law of the country applies to burghs of barony. They have power to administer their common good, to elect their burgh officers, to make by-laws, and their burgesses are entitled to challenge the sale or other disposition of the burgh's property.

Burghs, Free, were burghs of barony enfranchised by crown charter with rights of trade both home and foreign, but subjected, at the same time, to the same class of public burdens and taxation which royal burghs had to bear as the price of their peculiar privileges. Since the gradual decay and ultimate suppression of commercial monopoly, this class of burghs has become extinct, or rather *all* burghs may now be said to be *free*.

Burghs of Regality were burghs of baronies, spiritual or temporal, enfranchised by crown charter, with regal or exclusive criminal jurisdiction within their own territories, and thence called *regalities* (q.v.). Some of these burghs of regality, especially those which were dependent on the greater bishops and abbots, were of high antiquity, and possessed jurisdiction and privilege of trade only distinguishable from those of royal burghs, by being more circumscribed in their limits. Since the abolition of hereditary jurisdictions by the act 20 Geo. II. c. 43, the distinction between burghs of regality and burghs of barony have ceased to be of any practical importance.

Burghs, Royal. A royal burgh is a corporate body deriving its existence, constitution, and rights, from a royal charter—such charter being either actual and express, or presumed to have existed, and by the accident of war and time, to have perished. By a Scotch act passed in 1469, a constitution was given to royal burghs, by which the right of appointing their successors belonged to the old councils, the act also containing the singular provision, that when the new council was chosen, the members of it, *along with those of the old council*, should choose all the office-bearers of the burgh, each craft or trade corporation being represented at the election by one of themselves. But this simple plan was not universally adopted, and the election gradually lost its former free and popular form—a close and exclusive proceeding being ultimately established in its place. This "close system," as it has been called, notwithstanding its repugnancy to the spirit of the times, and modern ideas of public administration, continued in force until the year 1833, when an act of parliament was passed, the 3 and 4 Will. IV. c. 76, amended by the 4 and 5 Will. IV. c. 87, and the 16 Vict. c. 26, by which it was abolished, and an entirely new constitution given to royal burghs, with the exception of nine of them, which, on account of the smallness of their population, were left unchanged till the passing of the municipal elections amendment act (Scotland) in 1868. These nine burghs were: *Dornoch, New Galloway, Culross, Lochmaben, Bervie, Wester Anstruther, Kilrenny, Kinghorn,* and *Kintore.* Of the other royal burghs, being those to which the reforming acts apply, the principal are—Edinburgh, *Glasgow, Aberdeen, Dundee, Perth, Dunfermline, Dumfries,* and *Inverness.* The leading provisions of these acts are as follows: All persons within the burgh qualified under the parliamentary reform act, 2 and 3 Will. IV. c. 65, in respect of property or occupancy of premises, and who have resided for six months next previous to the last day of June, within the royalty, or within 7 m. of it, are entitled to vote in the election of councilors. In such burghs as do not now send members to darliament, property of the same value is required for the qualification, and claims for this privilege must be lodged with the town-clerk on or before the 21st of July, in a particular form. The councilors are chosen from among the electors residing, or personally carrying on business, within the royalty; and where there is a body of burgesses in the burgh, each councilor, before his induction, must be entered a burgess—a requisite clearly unnecessary for the purposes of the municipal administration contemplated by the act, and which, it is expected, will be done away. The number of councilors in each burgh is such as, by the *sett* or constitution existing at the passing of the act, formed the common council, or, where this was variable, the smallest number making a full council. The electors of Edinburgh, Glasgow, Aberdeen, Dundee, Perth, Dunfermline, Dumfries, and Inverness, are divided into wards or districts. At the election immediately succeeding the passing of the act, each ward elected six councilors; but as every year the third part of the council goes out of office, in the order prescribed by the act, two councilors are now annually chosen by each ward, there being no bar, however, to the re-election of an outgoing councilor. The electors in other burghs choose the whole council exactly as these wards do their proportion of it, and consequently elect each year a third part in place of that which has retired. Upon the third lawful day after the election succeeding the passing of the act, the councilors meet and choose, by a plurality of voices, a provost, bailies, treasurer, and other office-bearers, as existing in the council by the sett or usage of the burgh; and vacancies occurring among such office-bearers, in consequence of the annual retirement of the third part of the council, are directed to be supplied from the councilors in like manner, as soon as the election of the new third has taken place, the first attending magistrate having a casting vote in cases of equality. Vacancies taking place during the year by death or resignation are supplied, *ad interim*,

by the remaining members of the council, and the persons so elected by the councilors retire at the succeeding election. The rights of the guildry, trades, etc., to elect their own dean or guild, etc., are still preserved; but they are now no longer recognized as official or constituent members of the council, their functions being performed by a member of the council, elected by a majority of the councilors. In Aberdeen, Dundee, and Perth, however, the dean of guild, and in Edinburgh and Glasgow, the convener of trades and the dean of guild, are, *ex officio*, members of council; and the electors in all the above-named burghs choose such a number of councilors as, together with these officers, makes up the proper number. No magistrate or councilor can be town-clerk. The magistrates and council possess the same powers of administration and jurisdiction as were enjoyed by the magistrates and town-council before the passing of the act; and none of them is responsible for the debts of the burgh, or the acts of his predecessors, otherwise than as a citizen or burgess. The existing council in all burghs royal must every year make up, on or before the 15th of Oct., a state of their affairs, to be kept in the town-clerk's or treasurer's office.

The police of burghs and other populous places, and the paving, draining, cleansing, lighting, and improving the same, are regulated by the 25 and 26 Vict. c. 101, which repeals several previous acts. In this act "burgh" is defined to mean all burghs and populous places whose boundaries have been fixed; and it is provided that the sheriff may fix the boundaries and so constitute a burgh in this sense, for purposes of improvement and police, at the instance of seven or more householders.

BURGH ACRES are acres or small patches of land lying in the neighborhood of *royal burghs* (q.v.), usually feued or leased out to burgesses or persons resident within the burgh. A Scotch act of parliament, passed in 1695, relating to the division or partition of lands lying runrig, excepts burgh acres, or, as the act calls them, "burrow and incorporat acres," from its provisions; but this is to be understood only of royal burghs, and not of burghs of barony or others.

BURGHERS, a name popularly given to a religious denomination in Scotland. See United Presbyterian Church.

BURGHS, Convention of. See Convention of Royal Burghs.

BURGKMAIR, Hans, a noted old German painter and wood-engraver, was b. at Augsburg, 1473. He was the father-in-law of the elder Holbein, and the friend of Albert Dürer, whose influence is manifest in B.'s works. Several excellent paintings by B. are preserved in the galleries of Munich, Berlin, Augsburg, and Vienna. But he is best known as a wood-engraver; his cuts amounting in all to nearly 700. Among the most celebrated of these is his "Triumph of the Emperor Maximilian," in 135 cuts, with a description by the emperor himself. Another fine series of 237 cuts, called "The Wise King," represents the deeds of Maximilian. B. is supposed to have died about the year 1559.

***BURGLARY** (through the old Fr. from Lat. *burgi latro*, a robber of a burg or inclosure), in the criminal law of England, is defined to be a breaking and entering the mansion-house of another in the night, with intent to commit some felony within the same, whether such intent be executed or not. It is peculiar to this crime, that it can only be committed in the *night-time*, which, by the 24 and 25 Vict. c. 96, s. 51, is considered as commencing at nine in the evening, and concluding at six in the morning of the next day. The next requisite of the crime, according to the definition we have given, relates to the *place* of its commission. It must be in a *mansion*-house, for such is the technical expression; but this is construed to mean any private dwelling, or any building temporarily or permanently used for that purpose. It cannot be committed in a distant barn, warehouse, or the like, unless there be a communication with the dwelling-house, nor in a house where no one resides. But it is B. to break into a house which is used as an occasional residence, and which the owner is in the habit of leaving for a short period, with the intention of returning, even although no one be in the house at the time of the offense. A chamber in a college, or an inn of court, is also within the meaning of a mansion-house; so likewise is a room or lodging in any private house, if the owner and the lodger enter by different outer doors; but if they both enter by one outer door, then the house is described as that of the owner. For the same reason, a building belonging to a corporation, and separately inhabited by the officers of the body corporate, is the mansion-house of the corporation, and not of the officers. Again, a shop which is part of another man's house, and hired merely for the purpose of work or trade, is not a dwelling-house, but B. may also by express enactment be committed in it, though the punishment is not quite so severe. This offense cannot be committed in a tent or booth erected in a market or fair, though the owner may lodge therein, for his doing so makes it no more B. to break open such an erection, than it would be to uncover a tilted wagon under the same circumstances. But it may be committed by breaking open a church, which, according to sir Edward Coke, is *domus mansionalis Dei*, that is, the mansion-house of God, and is now expressly protected.

As to the *manner* of committing B., it is laid down by Blackstone that there must be both a breaking and an entry to complete it. There must, in general, be an actual breaking, a substantial and forcible irruption—as, at least, by breaking, or taking out

the glass of, or otherwise opening a window; picking a lock, or opening it with a key; nay, by lifting up the latch of a door, or unloosening any other fastening. But if a person leaves his doors or windows open, it is his own folly and negligence, and if a man enters therein, it is no B.; yet if he afterwards unlocks an inner or chamber door, it is so. To come down a chimney is held a burglarious entry, for that is as much closed as the nature of things will admit; so also to knock at a door, and upon its being opened, to rush in with a felonious intent; or, under pretense of taking lodgings, to fall upon the landlord, and rob him. If the servant conspires with a robber, and lets him into the house by night, this is B. in both.

The *intent* must also appear, otherwise the offense will amount only to a trespass; and it must be an intent to commit felony, which may be inferred from the conduct of the offender while in the house.

The punishment for this crime is now regulated by the act 24 and 25 Vict. c. 96, called the larceny consolidation act. The provisions are to the effect, that any one convicted of B. shall be liable to penal servitude for life, or any term not less than five years, or to be imprisoned for any term not more than two years; and in the case of imprisonment, hard labor and solitary confinement may be superadded. It is further enacted, that whosoever shall burglariously break and enter into any dwelling-house, and shall assault with intent to murder any person being therein; or shall stab, cut, wound, beat, or strike any such person, shall be guilty of felony, and suffer penal servitude for five to seven years, or two years' imprisonment and hard labor. And by the same statute, section 58, it is enacted that any person found *by night*, armed with any dangerous or offensive weapon or instrument, or with housebreaking implements, or with face blackened or disguised, with intent to enter any buildings, and to commit felony therein; or if he be found by night in any building with intent to commit a felony therein—is liable to penal servitude for five years, or imprisonment not exceeding two years; and in case of a second conviction, is liable either to such imprisonment or to penal servitude for a period not less than five years, and not exceeding ten years.

Blackstone observes, that this offense was anciently called hamesecken, as, he adds, it is in Scotland to this day. But the Scotch law on this subject has some points of difference—hamesecken, or hamesucken, as it is spelled in the Scotch books, not being quite identical with B.: thus, the former is an offense exclusively against the *person*, and it may be committed in the daytime as well as at night; and there are other points of dissimilarity. The Scotch law relating to *housebreaking* and *stouthrief* affords analogies. See HAIMSUCKEN, HOUSEBREAKING, STOUTHRIEF, LARCENY, ROBBERY, ASSAULT.
See *Supp.*, page 883.

BUR'GLEN, a village of Switzerland, in the canton of Uri, about 2 m. from Altorf. It is celebrated as the birthplace of William Tell. The supposed site of the patriot's house is now occupied by a chapel, upon the walls of which are represented certain well-known scenes from his history. Pop. '71, 1391.

BURGOMASTER. See GULL.

BUR'GOS, a city of Spain, capital of the new province of the same name, and of the former kingdom of Old Castile, is situated in a fertile valley at the foot of the Sierra d'Oca, and on the right bank of the river Arlanzon, in lat. 42° 20′ n., and long. 3° 45′ w. Pop. 29,683. B. is a very ancient place, having been founded in 844. Many of the gloomy old houses of its early history still remain. In the castle of B., Edward I. of England was married to Eleanor of Castile. The cathedral of B., founded in 1221, is one of the noblest specimens of Gothic architecture in Spain. Its various chapels are rich in fine sculpture and tombs. It was the birthplace of the Cid (q.v.). B. has manufactures of woolens, linens, and hats, but it depends chiefly on the traffic which its position on the great road from France and the northern Spanish provinces to Madrid secures it. B. has several charitable and educational institutions. It formerly had a much larger population—as many as 50,000—but on the removal of the court to Madrid in the 16th c., B. began to decline in population and importance. It was further greatly injured in Nov., 1808, by the French, who sacked it. In 1812, the castle was four times unsuccessfully besieged by Wellington, who, however, took it in the following year, when the French blew it up, as well as the fortifications.—The province of B. has an area of 5650 sq.m., and a pop., in 1877, of 332,461. The surface is elevated, the soil fertile, yielding grain and fruits. The hills afford rich pasturage; and the minerals gold, silver, iron, lead, and copper are found.

BURGOYNE, JOHN, a British general and dramatist, natural son of lord Bingley, early entered the army, and in Aug., 1759, was appointed lieut.col. commandant of the 16th light dragoons. In 1761, he served at Belle isle, and in 1762 commanded a force sent into Portugal for the defense of that kingdom against the Spaniards, when he surprised and captured Alcantara. In 1776, he served in North America, and in the summer of 1777 he was appointed to the command of a large force ordered to penetrate from Canada into the rebellious districts. The early part of the expedition was marked by his capture of Ticonderoga; but neglecting to preserve his communications with Canada, he encountered the greatest difficulties, and was at last obliged to surrender with his army to gen. Gates, at Saratoga. Soon after his return to England, having been denied an audience of the king, and refused a court-martial, he went over to the opposition party, and voluntarily resigned all his appointments. On a change of ministry, at the close of

the American war, he was appointed commander-in-chief in Ireland. This office he resigned two years after, and subsequently seems to have devoted his time to light literature. He was the author of some pamphlets in defense of his conduct, and of *The Maid of the Oaks* (1780); *The Heiress* (1786); and other stock dramatic pieces. B. was one of the managers for conducting the impeachment of Warren Hastings. He died in 1792. See *Episodes from the Life and Letters of B.*, by Barrington and Fonblanque (1876).

BURGOYNE, Sir John Fox, Bart., an eminent engineer-officer, b. in 1782, entered the royal engineers in 1798. From 1800 to 1807, he served in the Mediterranean; was with Moore at Carunna in 1809; and served under sir Arthur Wellesley in the peninsula till the conclusion of the war in 1814, being present at all its sieges. In 1814, he was commanding engineer of the expedition to New Orleans, and in 1826 of that sent to Portugal. In 1851, he obtained the rank of lieut.gen., and in 1854 was made D.C.L. of Oxford university. In the Crimean war, he was chief of the engineering department of the British army till recalled in 1855. For his services at Sebastopol, he received from the sultan the order of the Medjidie, and from the French emperor that of grand officer of the legion of honor. He was made gen. in 1855, and created a baronet in 1856. He died 7th Oct., 1871.

BURGUNDY, the name of a once independent kingdom of wide extent, but most frequently used of an old French province (Fr. *Bourgogne*) now divided between the departments of Côte-d'Or, Saone-et-Loire, and Yonne. The ancient Burgundians (*Burgundi* or *Burgundiones*), originally a German tribe, were at first settled on the banks of the Oder and the Vistula, and afterwards extended themselves to the Rhine and the Neckar, and, in 407, penetrated into Roman Gaul. Their conversion to Christianity took place in the course of eight days! They adopted a brief Arian confession of faith, and were baptized. From 407 to 534, the kingdom of B. was several times divided; and in 451, Gundicar, king of B., with 10,000 men, confronted Attila, but was defeated and slain.

In 534, B. passed under the rule of the Franks; but the weak government of the later Carlovingian kings allowed a part of it once more to assert a separate existence as a dependency of the empire under Boso of Vienne in 832. Boso's realm, known as Cisjuran B., or the kingdom of Arelate (Arles), lay mainly in the basin of the Rhone. A second Burgundian state arose about the same time in the country between the Saone and the Reuss, and was known as Transjuran or Upper Burgundy. These states, united in 930, were for a time powerful and famous; but in 1038, on the extinction of the royal dynasty, B. became part of the German empire. It was afterwards broken into several fragments, which were gradually absorbed by France.

A similar fate befell the third Burgundian state, the dukedom of B. or Lower B., which was formed by a brother of Boso. Yet the dukes of B. played a large part in the history of mediæval Europe, and were long the dangerous rivals of the French kings. The nucleus of the dukedom was in Lower B., the region which afterwards became the French province of B., to the n. and w. of the other Burgundian realms; but the second line of dukes, beginning in 1363 with Philip the hardy, son of the French king John, held under their sway not only Franche Comté and adjoining portions of France proper, but great part of the Low Countries. Charles the bold (q.v.) was one of the most powerful sovereigns of Europe. Louis XI. of France succeeded in incorporating the duchy with the kingdom of France.

BURGUNDY, Louis, Duke of, the grandson of Louis XIV. of France, and dauphin of France after the death of his father, was b. at Versailles in 1682. Even in childhood he was ungovernable, and became excessively violent and haughty, and abandoned to all gross and sensual passions. Although educated under the care of the abbé Fénélon, he used, when 30 years of age, to divert himself with drowning flies in oil, and blowing up living frogs with gunpowder. He had the misfortune to be deformed; his deportment and manners were undignified, and his mind was imbued with bigotry. When only about 15 years of age, he was married to the princess Adelaide of Savoy, and spent his time wholly in amusements in the company of his spouse, and of the ladies of the court. Nevertheless, in 1701, he was nominally appointed generalissimo of the army, really under the command of the duke de Vendôme, and is said to have shown some spirit in a cavalry-fight at Nimeguen; but he quarreled with Vendôme, chiefly because he had once been compelled to establish his head-quarters in a nunnery. He lost the respect of the army, and was exposed to many humiliations, partly proceeding from intrigues set on foot against him out of envy by his father. He returned to the court more eccentric, gloomy, and unsociable than before. But when he became, on his father's death, the second person in the kingdom, all his defects vanished from the sight of the courtiers, and flattery bestowed on him the title of the great dauphin. He died suddenly in the year 1712. A few days previously, his wife and her son, the duke of Bretagne, had died, and the same hearse carried father, mother, and child to St. Denis. The duke of Orleans, subsequently regent, and his daughter, the duchess of Berri, were accused, but without reason, of having caused them to be poisoned.

BURGUNDY PITCH, a resinous substance prepared from common frankincense (q.v.), the spontaneous exudation of the Norway spruce-fir (*abies excelsa;* see Fir) by melting it in hot water, by which means it is freed from a considerable part of the volatile oil which it contains. By straining it through a coarse cloth, impurities are also removed.

B. P. is of a yellowish-white color, hard and brittle when cold, but softening by the heat of the hand, and readily adhering to the skin. It has a not unpleasant resinous odor, and a slightly bitter taste. It is used in medicine as an external application only, and generally acts as a mild irritant. A very common application of it is as a plaster in complaints of the chest, and in rheumatic complaints. It enters also as an ingredient with resin, oils, etc., into a compound plaster of similar use. The B. P. of commerce is now principally brought from Hamburg; but the greater part of what is sold under that name is really manufactured of common resin and palm-oil, or from American turpentine. It has a fuller yellow color than the genuine B. P., and a less agreeable odor.

BURGUNDY WINES are chiefly the produce of vineyards cultivated on the hilly lands forming the Côte d'Or, between Dijon and Chalons. These hills average about from 800 to 1000 ft. in height; the vineyards ascend up the slopes in terraces, and spread along the table-land on the summit. "In richness of flavor and in perfume, and all the more delicate qualities of the juice of the grape, the wines grown here unquestionably rank as the finest in the world." The most celebrated of the *red* wines of Burgundy are the Closvougeot (near Beaune), Nuits, Chambertin (the favorite wine of Louis XIV. as well as of Napoleon), the Romané-Conti, Richebourg, Volnay, and Pomard. Of other red wines of Burgundy not grown on the Côte d'Or, those of Pitoy, Perrière, Preaux, and Auxerre are held in most repute. The *white* wines of Burgundy are also the finest in France, but being produced in less quantity, they have less celebrity. The quantity of wine annually produced in Burgundy averages 3,500,000 hectoliters (77,000,000 gallons), of which only about a fifth is consumed in the district.

BURHÁNPUR, a t. in British India, 280 m. n.e. of Bombay, 21° 31′ n., and 76° 20′ e.; 2 m. from the railway station of Lalbagh. It was founded in 1400, and was the chief seat of the government of the Deccan provinces of the Mogul empire until 1635. In 1861, it was ceded to the British government. Pop. '72, 29,303. B. is celebrated for its muslins, flowered silks, and brocades. [See same t. in next article.]

BURHAUNPUR′, a large t. of India, in the territory of Gwalior, or possessions of Scindia's family, on the right bank of the Tapti, in n. lat. 21° 18′, e. long. 76° 20′, 280 m. n.e. from Bombay. The banks of the Tapti are here bold, rising 60 or 70 ft. above the stream. The town is surrounded by a rampart of brickwork, and contains a palace built by Akbar. A few of the wealthier merchants have good houses, built of teak, and profusely decorated with carvings. The most wealthy and influential are the Borahs, a Mohammedan tribe, who inhabit a distinct ward, which they shut up at night, excluding all other persons. There are manufactures of muslins, flowered silks, and brocades, for which the place was formerly famous, so that, in the 17th c., they were exported in great quantities to Persia, Egypt, Russia, and Poland.

BURIAL, a word of Teut. origin (Ang.-Sax. *birgan*, to conceal), is applied to the prevalent method among civilized nations of disposing of the dead, by hiding them in the earth. As there is almost nothing else so deeply interesting to the living as the disposal of those whom they have loved and lost, so there is perhaps nothing else so distinctive of the condition and character of a people as the method in which they treat their dead. Hence, funeral customs associate themselves with a wide variety of sentiments, from gentle and rational sorrow, up to deification of the departed, accompanied sometimes with cruelty and ferocity towards the living. People of a low and barbarous type carelessly permit the remains of the dead to lie in the way of the living, and there are a few instances in which the object of artificial arrangements has been to preserve a decorated portion of the body—as, for instance, a gilded skull—among survivors. The general tendency of mankind, however, has always been to bury the dead out of sight of the living; and various as the methods of accomplishing this end have been, they have resolved themselves into three great classifications: 1. The simple closing up of th body in earth or stone; 2. The burning of the body, and the entombing of the cinders; and, 3. The embalming of the body. The first of these seems to be the earliest form of which we have any record, and it is the form most amply sanctioned by the existing practice of the civilized world. It is the method referred to in the earliest scriptures; and all are familiar with the touching scene in which Abraham buries Sarah in the cave in the land of Canaan which belonged to Ephron, but was, after a solemn and courteous negotiation, secured to Abraham for a possession to bury his dead in (Gen. c. 23). The horrible fate of being left unburied, either from scorn or neglect, is powerfully told in the prophecy of Jeremiah against Jehoiakim: "He shall be buried with the burial of an ass, drawn and cast forth beyond the gates of Jerusalem." There is frequent allusion in the later scriptures, and especially in the New Testament, to the embalming of the body in antiseptics and fragrant substances; and the burning of the bodies of Saul and his sons is accounted for by commentators on the supposition that they were too far decayed to be embalmed. The Israelites may have learned the practice of embalming from the Egyptians, among whom it was an art so greatly cultivated and extensively practiced, that Egyptian corpses, as inoffensive as any article of wood or stone, are scattered over Europe in museums, and are even to be found as curiosities in private houses. The soil and climate of upper Egypt seem to have afforded facilities for



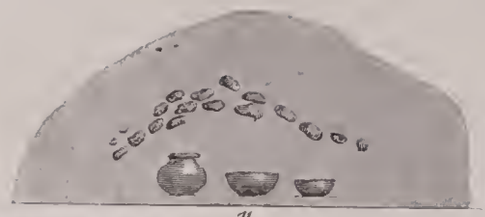
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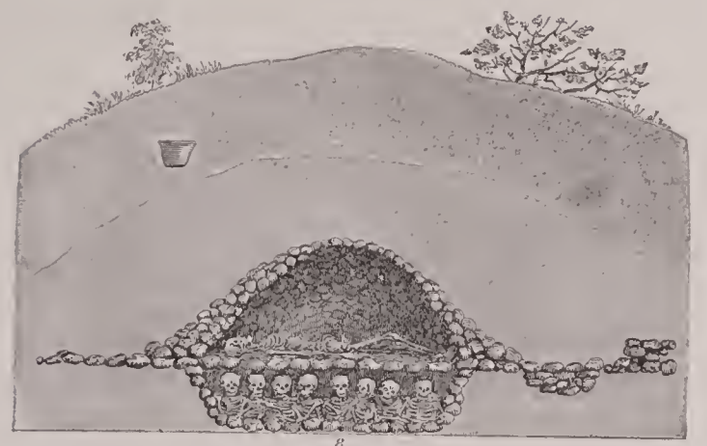
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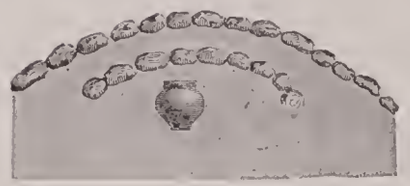
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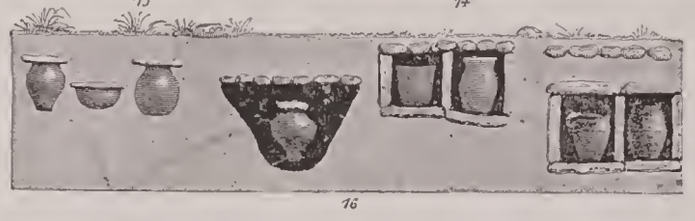
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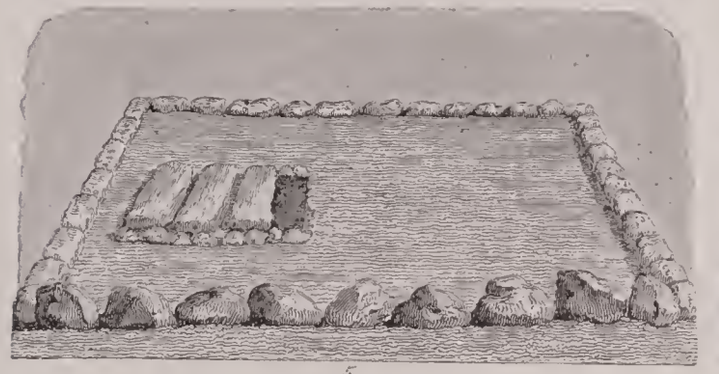
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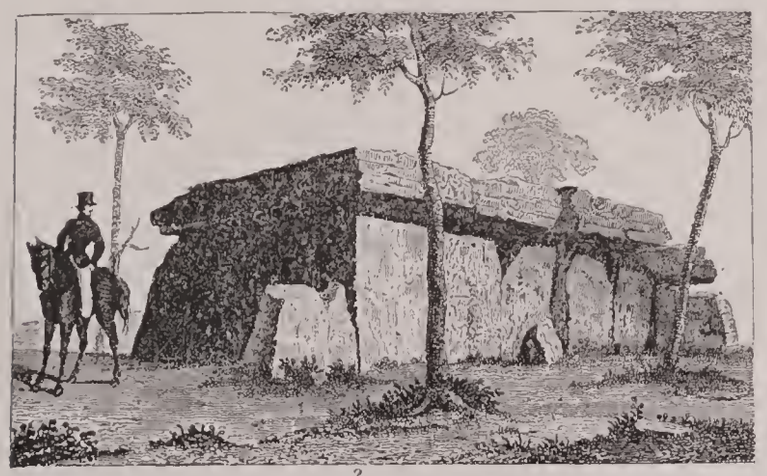
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BURIALS.—1. Hun's grave (Lower Saxony). 2, 3. "Fairy grotto" at Saumur. 4. Cromlech. 5. Hun's bed (Mecklenburg). 6. Giant's room (Westgothland.) 7. Catacombs : place of burial and worship. 8. Grave for nobleman and slaves (Mecklenburg). 9–15. Mound graves with ash-urns. 10. Old German wood-coffin. 16. Grave in level ground.

embalming unmatched in any other part of the world; and in other places the vestiges of the practice are comparatively rare, though it is usual even yet to embalm royal corpses, and in some places to preserve a series of mummies, as in the vault of the monastery of Kreuzberg, at Bonn, where the monks have been successively preserved in their costume for centuries. The practice of incremation, or of the burning of the body, and the entombing of the ashes, deserves more inquiry than it has yet obtained. In Greece, in Etruria—both before and after it came under the Romans—and in the n. of Europe, the simple burial of the body, and its prior reduction to ashes, were both practiced, and sometimes contemporaneously. The tombs of Etruria are rich in art, much of it going to the adornment of the urns of baked clay in which the ashes of the dead are kept. Vessel of *terra-cotta*, or cooked earth, containing human remains, have been found, often so large that they appear to have served as coffins for containing the whole body. Vessels of this kind were found in the valley of the Scamander by some British officers while spending their leisure time after the siege of Sebastopol, upon the ground supposed to have been occupied by the besiegers of Troy. Smaller cinerary urns have been found over so extensive a portion of the world, that it is difficult to define the limits to which they belong. The Danish antiquaries say, that in their stone period, when the use of metals was unknown, the dead were all buried unburned in stone chambers, and that the burning of the bodies and the preservation of the ashes in urns came in with the age of bronze. These antiquaries associate with the older system those amorphous mounds of earth or stone called barrows or tumuli, which are to be found all over the n. of Europe. Mr. Bremner, in traveling among the steppes of the Ukraine, saw multitudes of these small mounds, which reminded him at once of what he had seen on the plain of Troy, at Upsala in Sweden, in Scotland, and in Ireland. The Irish tumulus of New Grange is perhaps the most remarkable of all, forming a connecting link between the simple barrow on the moor and the pyramids of Egypt, which are the perfection of the same kind of structure applied to the same purpose—the burial of the distinguished dead. These structures open up a large field of curious inquiry. The simple theory, that they were raised over the dead, has lately been disturbed by the discovery that many of them are not artificial, but relics of sheets of alluvial matter, the mass of which has been carried away; and even in these, human remains have been found, the natural mounds having been used as monuments. Even when human remains are connected with barrows, cromlechs, or the large shapeless pillars commonly called Druidical, it is often questionable whether the monument was made to receive such remains. It is certainly ascertained to have been a practice in ancient times to bury bodies in tombs which were themselves ancient when they received their inmates.

Some of the grandest buildings in the world have been tombs; such are the pyramids, the castle of St. Angelo, the tomb of Cæcilia Metella, and many temples scattered over Hindustan and other eastern countries. Thus, the respect paid by the living to the dead has preserved for the world many magnificent fruits of architectural genius and labor. A notion that the dead may require the things they have been fond of in life, has also preserved to the existing world many relics of the customs of past ages. The tombs of Egypt have supplied an immense quantity of them, which have taught the present age more of the manners of ancient nations than all the learned books that have been written. It is an awful remembrance, at the same time, that inanimate things were not all that the dead were expected to take with them. Herodotus tells us of favorite horses and slaves sacrificed at the holocaust of the dead chief. The same thing has been done in our own day in Ashantee. In many countries, the wives had the doom, or privilege, as it was thought, of departing with their husbands; and down to the present generation the practice has lived in full vigor in the Hindu sutti. Among the Jews, the Greeks, the Romans, and many ancient nations, the dead were buried beyond the towns. The "stop, traveler!" was a usual memorandum on Roman tombs. In Christian countries, if the remains of the saint to whom a church was dedicated could be obtained—or any thing passing for the remains—they were buried near the altar in the choir. It became a prevalent desire to be buried near these saints, and the bodies of men eminent for their piety, or high in rank, came thus to be buried in churches. The extension of the practice was the origin of churchyards. These, in crowded towns, became offensive and unhealthy. It can scarcely be said that this practice, so detrimental to the public health, as the B. within churches, was checked in this country until the whole system of intramural interment, as it was called, was attacked, about the year 1844, by Mr. Chadwick and other sanitary reformers. Measures were afterwards carried for shutting graveyards in crowded cities, and placing interments in open cemeteries under sanitary control. The first great measure was passed in 1850, when the board of health was made a B. board for the metropolis, and power was given to the privy council to close the city graveyards. The act was modified two years afterwards, by transferring the duties of managing cemeteries to local boards appointed by the vestries. It was in London that the danger was most urgent and the remedy immediate. It was extended to the English provinces in 1853, and to Scotland in 1855.

In England, B. in some part of the parish churchyard is a common law right, which may be enforced by mandamus—that is, every person may be buried in the parish where he dies. But the body of a parishioner cannot be interred in an iron coffin

or vault, or even in any particular part of a churchyard, as, for instance, the family vault, without an additional fee.

The fact that the only religious service which can at present be conducted at the grave is that of the church of England, has led of late years to the repeated proposal in parliament of measures to permit dissenters to have their own services performed in the churchyard—as yet without results.

By the canons of the church of England, clergymen cannot refuse or delay to bury any corpse that is brought to the church or churchyard; on the other hand, a conspiracy to prevent a B. is an indictable offense, and so is the willfully obstructing a clergyman in reading the B. service in a parish church. It is a popular error, that a creditor can arrest or detain the body of a deceased debtor; and the doing such an act is indictable as a misdemeanor. It is also an error, that permitting a funeral procession to pass over private grounds creates a public right of way. By the 3 Geo. IV. c. 126, s. 32, the inhabitants of any parish, township, or place, when going to or returning from attending funerals of persons in England who have died and are to be buried there, are exempted from any toll within these limits. And by the 4 Geo. IV. c. 49, s. 36, the same regulation is extended to Scotland; the only difference being, that in the latter case the limitation of the district is described by the word *parish* alone. The 6 and 7 Will. IV. c. 86 regulates the registry of deaths. The 4 Geo. IV. c. 52 abolished the barbarous mode of burying persons found *felo de se*, and directs that their B. shall take place, without any marks of ignominy, privately in the parish churchyard, between the hours of nine and twelve at night, under the direction of the coroner. The B. of dead bodies cast on shore is enforced by 48 Geo. III. c. 75. See Wharton's *Law Lexicon*.

In Scotland, the right of B. in a churchyard is an incident of property in the parish; but it is a mere right of B., and there is not necessarily any corresponding ownership in the *solum* or ground of the churchyard. In Edinburgh, however, the right to special B. places in churchyards is recognized.—For B. in cemeteries in England and Scotland, see CEMETERY.

BURIAL ACTS. These are the 15 and 16 Vict. c. 85, for London; the 16 and 17 Vict. c. 134, the 17 and 18 Vict. c. 87, and the 18 and 19 Vict. cc. 79 and 128, for places in England beyond the limits of the metropolis—all as amended by the 20 and 21 Vict. c. 81, and the 22 Vict. c. 1, 23 and 24 Vict. c. 64, 25 and 26 Vict. c. 100, 34 and 35 Vict. c. 33. These acts were rendered necessary when it was resolved on sanitary grounds to put a stop to burials in populous places, which could only be effectually done by giving power to parishes to acquire other burial-grounds in rural places. These statutes have long been proverbial for their confusion (e.g., 20 and 21 Vict., which proposes in the preamble to amend 18 and 19 Vict. c. 78, really amends c. 79), and relate to the appointment of burial-boards for parishes—the authorizing new burial-places, proper sanitary regulations, the control by the government and by order in council, and many other details too numerous to specify here. Our readers must be content with our referring them to the acts themselves, or to their lawyers.

The corresponding acts for Scotland are the 18 and 19 Vict. c. 68, amended by the 20 and 21 Vict. c. 42, and 29 and 30 Vict. c. 50.

BURIAL SOCIETIES are friendly societies constituted in the usual manner, and with the express object of supplying a fund for paying the funeral expenses of the members on their death. See FRIENDLY SOCIETIES. It became customary to enter the names not only of adults, but of children, in such societies. The proceedings of the criminal courts have shown that, in some instances, children on whose lives such an insurance was effected have been killed or allowed to die of neglect, and the alarm created by such instances was enhanced by the discovery that children were frequently insured in more than one society. To obviate this calamitous use of a beneficial arrangement, it was provided that no insurance of a child under six years of age in a burial society should be legal. It was attested to the select committee of the commons on friendly societies in 1849, that the practice of such insurances continued in uncertified societies; and at the same time it was stated on behalf of the friendly societies: "In our long experience with these societies in Liverpool, in which are nearly 100,000 members, approximating to nearly one third of the population of this great town, we have not had one instance of death by violence for the sake of the burial money." In the friendly societies act of 1850, and in subsequent enactments, stringent arrangements for certifying the cause of death have been adopted as a sufficient protection from this crime.

BURIATS, a Mongolian people in the vicinity of lake Baikal. They are scattered in various tribes that take the names of their special localities; and the tribes are subdivided according to kinship. In 1857, the B. numbered about 190,000. They have high cheek-bones, flat noses, and sparse beard on the chin; they shave the head, leaving a cue at the top, like the Chinese. In summer they dress in wool and cotton; in winter in sheep-skins and furs. Rearing cattle is their chief occupation, and some of them possess large herds. A few tribes engage in agriculture, and in 1839 the B. had about 240,000 acres under cultivation. The soil is fertile, and they have an elaborate system of irrigation. Some activity is shown in trapping and fishing. In religion they are mainly Buddhists; their chief lama living at Goose lake. Some are Shamanists, and their sacred spot is the Shamanist stone at the mouth of Angar river. About 10,000 are

Christians. Reading and writing are general among the B., and they have books of their own, translated from the Thibetan. Their language is Mongolian, and in three distinct dialects. The Russians first explored the region in 1631, and after several unimportant contests permanently subdued the B. before the end of the 17th century.

BURIDAN, Jean, a scholastic metaphysician of the nominalist party, was b. at Bethune, in Artois, in the 14th c., and studied at Paris under Occam, where he also became a teacher of philosophy. The events of his life, as well as the manner of his death, are very obscure. One account states that he was thrown into the Seine by command of Marguerite de Bourgogne, daughter-in-law of Philippe le Bel, whose infidelities he had rebuked. Another, later, but less mythical-looking account, states that B. was driven from France as a disciple of Occam, and fled to Austria, where he founded a school. His elucidations of Aristotle are among his most useful writings. In his *Logic*, his great endeavor was to facilitate the discovery of middle terms for all kinds of syllogisms. The celebrated sophism known to the schoolmen under the name of Buridan's Ass, has been discussed at superfluous length, and with needless ingenuity, by Bayle. It is not at all likely that it was ever adduced by B., but more probably by his adversaries, who wished to ridicule his metaphysical doctrine of *Determinism*—viz., that in every mental and bodily action the will must be determined by something out of itself. The sophism referred to is that if a hungry ass be placed exactly between two bundles of hay of equal size and attractiveness, it must starve, as there is nothing to determine the will of the animal towards either bundle. His chief works are *Summula Dialectica* (Paris, 1487); *Compendium Logicæ* (Venice, 1489; Oxford, 1637); *In Aristotelis Metaphysica* (Paris, 1518).

BU'RIN, or Graver, the principal instrument used in copper-engraving, is made of tempered steel, and is of prismatic form, the graving end being ground off obliquely to a sharp point. The style of a master is frequently described by the expressions *soft* B., *graphic* B., *brilliant* B., or whatever other character may belong to it.

BURITI PALM, *Mauritia vinifera;* see Mauritia; a beautiful palm which grows in great abundance in the swamps of some parts of the n. of Brazil. It is one of the loftiest of palms. Its leaves are fan-shaped, and form a large globular head at the top of the stem. It produces a great number of nuts about the size of a small hen's egg, covered with rhomboidal scales arranged in a spiral manner. Between these scales and the albuminous substance of the nut, there is an oily reddish pulp, which is boiled with sugar, and made into a sweetmeat. An emulsion is also prepared from it, which, when sweetened with sugar, is a very palatable beverage, but if much used, is said to tinge the skin of a yellow color. The juice of the stem also makes a very agreeable drink; but to obtain it, the tree must be cut down, when several holes about 6 in. square, 3 in. deep, and 6 ft. apart, are cut in the trunk with a small axe; and these in a short time are filled with a reddish-colored liquid, having much the flavor of sweet wine.

BURKE, a co. in e. Georgia, on the Savannah river and the Central Georgia railroad; 1040 sq.m.; pop. '70, 17,639—13,436 colored; in '80, 27,130. Surface hilly, with fertile soil, producing corn, sweet potatoes, and cotton. Co. seat, Waynesborough.

BURKE, a co. in w. North Carolina, on the Catawba river and the Wilmington and North Carolina railroads; 450 sq.m.; pop.'80, 12,811—2,721 colored. Surface mountainous, with fine scenery; productions agricultural. Co. seat, Morgantown.

BURKE, Edmund, a philosopher and politician, distinguished over all the men of his times for eloquence and political foresight, was born in 1730, in Dublin, where his father had an extensive practice as an attorney. As a schoolboy, he displayed those traits of character and the germs of those powers which ultimately gave him greatness. In 1744, B. entered the university of Dublin, of which he became a scholar. His undergraduate course was not unmarked by the ordinary distinctions of successful application; but it would appear that he mainly devoted himself to his favorite studies of poetry, oratory, history, and metaphysics. In Feb., 1748, he graduated B.A., and in 1751 took his degree as master of arts. In the interval (1750), being destined for the English bar, he proceeded to London, to keep his terms at the Middle Temple. To legal studies, however, he never took kindly, and ultimately he abandoned the idea of becoming a barrister. During the years 1750–56, he would appear to have occupied himself in traveling through England, enjoying the society of literary men, in study, and finally in writing for various periodicals.

B., when yet at the university, had achieved a local reputation for literary talent and eloquence. Among the compositions of his undergraduate life the most noticeable perhaps is his translation of the conclusion of the second Georgic of Virgil, which shows poetic talent of no mean order. His first important publication, however, was the celebrated *Vindication of Natural Society*, written in imitation and ridicule of the style and reasoning of lord Bolingbroke, in which, with well-concealed irony, he confutes his lordship's views of society by a *reductio ad absurdum*. This work, published anonymously in 1756, at the age of 26, attracted considerable attention. Soon after, in the same year, appeared his well-known essay, *A Philosophical Inquiry into the Origin of our Ideas of the Sublime and Beautiful*—a work containing a comprehensive induction of the various *sources* of the ideas referred to, but which must be pronounced a failure, so far

as it pretends to analyze into their primary elements the emotions of the sublime and beautiful.

The essay on the *Sublime and Beautiful* attained a rapid popularity, and its author soon found himself courted by all the eminent men of his time. Garrick was already one of his friends; among them he soon could count Reynolds, Soame Jenyns, lord Lyttelton, Warburton, Hume, and Dr. Johnson. Notwithstanding this popularity, however, his progress continued slow; for three years yet, he had to occupy himself with periodical writing, devoting his leisure principally to political subjects. What is considered a joint work of B. and his cousin, William Bourke, appeared in 1757—viz., *An Account of the European Settlements in America*—and shows how carefully at this date he had studied the condition of the colonies. In 1761, Mr. W. G. Hamilton ("Single-speech Hamilton"), then secretary for Ireland, having appointed him his private secretary, he returned to Dublin, where, during two years' service, he demonstrated his aptitude for political business, receiving in 1763, in reward of his services, a pension on the Irish establishment of £300, which, however, he did not long enjoy.

Returning to London, B., in 1764, along with Reynolds, founded the literary club, the history of which is associated with almost every considerable name in the literature of the period. But literary society did not call off his attention from the chances of a political career. He became private secretary to the marquis of Rockingham, on his becoming premier, and at the same time entered parliament as member for Wendover Here his eloquence at once made him the reputation of being "the first man in the commons." The Rockingham administration, however, lived only a few months, and with it terminated this his second political employment. To trace his subsequent career in parliament is more than the limits of this article will allow; it must suffice to state briefly that his parliamentary life extended from 1766 to 1794 without intermission; that he was successively member for Wendover, Bristol, and Malton; twice held the post of paymaster of the forces, once under Rockingham, and again under lord North, with the standing of a privy councilor; that after a career in parliament remarkable for the laboriousness, earnestness, and brilliancy with which every duty was discharged, and extending over nearly 30 years, he retired at last, receiving the thanks of the commons for his numerous public services, and rewarded by government, on the express request of his sovereign, with pensions amounting in all to £3700. It would be wrong, however, to omit that, as paymaster of the forces, he, with a scrupulous regard to public economy, sacrificed all the perquisites of his office, exhibiting a severe integrity unexampled among public men; and that in his relation with the constituency of Bristol, which was alienated from him by his advocacy of the claims of the Roman Catholics and of the opening up of the trade of Ireland, he was the first to maintain the doctrine of the independence of parliamentary representatives—that they are not machines to vote for measures approved by their constituencies simply for that reason, but men and thinkers chosen by them to calmly consider and legislate for the good of the commonwealth. It must also be mentioned, that during his career he rendered more important service to the cause of humanity than any man of his time: he prepared the way for the abolition of the slave-trade, a measure which was destined to ripen to success in the hands of Wilberforce; he advocated the cause of humanity in India against the voracious greed of stockholders, who regarded its millions simply as materials for plunder, and largely contributed to improve the government of that country. Towards America he advocated a policy of justice and conciliation, which, had it been adopted, would have averted the horrors of the war of independence, and retained the colonies in amity with the mother-country. And to the advocacy of every cause which he espoused, he brought a capacity for patient research that was unlimited, and an eloquence that has never been transcended.

Before proceeding to remark on the character and powers of B., a very brief notice must be taken of his leading literary efforts connected with his political labors. Little more than a catalogue can here be given of them. Omitting a variety of valuable letters —several on the condition of Ireland—notice must be taken of his *Observations on a Pamphlet on the Present State of the Nation*, being his first political pamphlet, published in 1769, in answer to one variously ascribed to Fox or Grenville. In 1770, he published a pamphlet, *On the Cause of the Present Discontents.* On the 13th Feb., 1788, he commenced his celebrated speech opening the trial of Warren Hastings (q.v.), the most remarkable trial, perhaps, in the history of the world. This speech lasted over four days, and has been characterized as "a tempest of invective and eloquence." No idea can be conveyed of the effect which it produced. The trial lasted seven years, and closed with another great and splendid oration from B., lasting over nine days. Hastings, it is well known, was acquitted. While this trial was advancing, B. found time to take part in all the current business. In 1790, appeared his *Reflections on the Revolution of France*, which sold in tens of thousands, and is said to have produced an effect never produced before nor since by any political essay. Hereafter, the world showered honors on B., of which space forbids even the enumeration. Having, in 1791, withdrawn from the whigs on the French question, he offered for the consideration of government, *Thoughts on French Affairs*, which, however, was not published till after his death. *Heads for Consideration on the Present State of Affairs* and *Reply to a Noble Lord* next followed, the latter being relative to himself personally. His last work,

Thoughts on a Regicide Peace, showed that he retained to the end of his life his whole powers unimpaired.

Few men have been the subjects of higher panegyric than B., and, on the whole, few have better deserved praise. He was noble-minded, pure in his life, and a purist in politics. Intellectually, he was most richly endowed; with much imagination, rare powers of observation, and indefatigable industry, there was no subject which he could not master, and none which, having mastered, he could not expound with unparalleled richness of language. But with these virtues and powers were conjoined defects, which, without bating their greatness, largely neutralized their influence. He was, it may be said, too literary to be a philosopher, and too philosophic to be a politician. His career would seem to illustrate this position. His oratory astounded by its brilliancy rather than persuaded by its tone and argument; and in the long-run, the eloquence which failed to command the reason, ceased to captivate the ear. The man who at first evoked the enthusiasm of the house by the brilliancy and power of his eloquence, did actually at last empty it by persistence in the monotonous splendors of his speeches. Passionate, and in a great degree untractable, he was unsuited for party politics, and drifted from all his connections, breaking up slowly all party ties, and even the ties of friendship, till he reached at last a state of almost political isolation. At the same time, it must not be forgotten how great an influence he, half philosopher, half politician, exercised on the counsels of the state; many of his views on politics and public economy were anticipations of science, as many of his previsions of the course of events were prophecies.

B. died on the 7th July, 1797, in his 68th year. A collected edition of his works in quarto was published in 1827. The latest edition is from the Clarendon press, begun 1866. See Macknight's biography of B., and Morley's *Edmund Burke, a Historical Study* (1869).

BURKE, Sir JOHN BERNARD, b. 1815; son of John, who started the genealogical books known as *Burke's Peerage*, etc., and continuing the work after the father's death. He was called to the English bar in 1839, and was knighted in 1854. He has published, besides the *Peerage and Baronetage, History of Dormant, Abeyant, Forfeited, and Extinct Peerages; History of the Landed Gentry; Vicissitudes of Families*, and other works.

BURKE, THOMAS N. (FATHER TOM). See page 883.

BURKING. See ANATOMY (in law).

BURLAMAQUI', JEAN JACQUES, a writer on natural law. He was professor and lecturer in Geneva, and was elected to the council of the state. His works are upon the principles of natural and political rights. He lived, 1694–1748.

BURLEIGH: co. Dak. See page 883.

BURLEIGH, CHARLES C. See page 883.

BURLEIGH, WILLIAM CECIL, Lord. See CECIL.

BURLEIGH, WILLIAM HENRY, 1812–71; b. Conn.; printer and editor of several literary and religious journals, among which were the *Christian Witness*, Pittsburg, Penn.; the *Charter Oak*, Hartford, Conn.; and the *Washington Banner*. He published a volume of miscellaneous poems.

BURLESON, a co. in central Texas, on Brazos river; 976 sq.m.; pop. '80, 9242—3888 colored. It has an uneven but productive soil, about two thirds covered with oak forests. Productions, corn, cotton, and wool. Co. seat, Caldwell.

BURLESQUE (from Ital. *burla*, jest, mockery), denoting a style of speaking, acting, writing, drawing, is a low and rude grade of the comic. The legitimate comic brings together contrasts with a final view to harmonizing and reconciling them; the B. distorts and caricatures, and brings the incongruities into stronger relief. The farce is the B. of comedy. Deformities and monstrosities that excite disgust do not belong to the burlesque. The lofty and the abject, the great and the little are conjoined, with the sole view of exciting a laugh. Nor does the true B. turn real greatness and nobility into laughter, but only sham greatness—false pathos, and all hollow pretension and affectation. The B. style appears to have been unknown to the ancients; it originated among the Italians, more particularly with the poet Berni (q.v.). The genuinely national *buffone* of the Italians personates the burlesque. Carlo Gozzi, in his tragi-comedies, is perhaps the greatest in the B. vein. Scarron among the French, and *Hudibras* in English, are examples. Parody or travesty (q.v.) is a species of burlesque.

BURLETTA, a comic operetta or musical farce.

BURLINGAME, ANSON, LL.D., 1820–70; b. N. Y.; educated in Michigan and Harvard universities, and practiced law in Boston. He was chosen to the state legislature and the constitutional convention. He was an early worker in the free-soil party when Van Buren was the presidential candidate; and was also a leader in the American party in 1854, and by them sent to congress. His denunciation of Brooks's assault upon senator Sumner provoked a challenge from the South Carolinian, which the Massachusetts member at once accepted, naming rifles as the weapons. Brooks did not fight. Burlingame was a congressman until 1861, and in that year was sent as minister to Austria, where the feeling against him because he had favored Hungarian independence led to a positive refusal to receive him as a diplomatic representative. He was then sent to China, where he was successful in negotiating certain treaties favorable to both countries, and for the first time securing China's recognition of international rights of property, trade, and worship. In 1869, having gained the full confidence of the Chinese

government, he was sent as minister of the Chinese empire to Russia, and other European countries, but died soon after entering upon his duties.

BURLINGTON, a co. in central New Jersey, between the ocean and the Delaware river; 600 sq.m.; pop. '80, 55,403. It is level and in some parts fertile, but much of it is sandy and covered with pine forests. Iron ore, marl, and petrified animal remains are found. Chief productions, cereals, potatoes, hay, butter, and wool. The railways are the Camden and Amboy, Camden and Burlington County, Pemberton and Hightstown, and branches of the New Jersey Southern. Co. seat, Mount Holly.

BURLINGTON, the name of three cities of some note in the United States.—1. A port of entry in New Jersey, on the Delaware, about 20 m. above Philadelphia, with which, as well as with New York, it is connected by the Camden and Amboy railway. It possesses an Episcopalian college, founded in 1846. Pop. '70, 5817, with about 13,000 tons of shipping.—2. The most populous city in Vermont. It is beautifully situated on the e. shore of lake Champlain. It communicates with the St. Lawrence by means of the Richelieu river and the Chambly canal; while through the Champlain canal it has access to the Hudson. It has railway communication with all parts of the United States and Canada. The Vermont university crowns the slope on which the city stands. Pop. '70, 14,387.—3. A city of Iowa, on the right bank of the Mississippi, 207 m. by rail w.s.w. of Chicago. It occupies a natural amphitheater formed by the limestone bluffs which slope backward from the river. It carries on a large commerce, and there are numerous foundries, breweries, soap-works, pork-packing establishments, flour-mills, and saw-mills. The city is the center of considerable railway communications, and possesses among its educational institutions, business college and Baptist university. Pop. '70, 14,933.

BURLINGTON (*ante*), a city in Des Moines co., Iowa, on the Mississippi; 207 m. w.s.w. of Chicago; pop. '80, 19,450. It is at the junction of several railroads, and is an important business point, having also many manufactories. The business portion is of the river shore, while private residences are on the high bluffs in the rear. It is the seat of Burlington university, and has other excellent schools. There are extensive coal and limestone deposits near by. From 1837 to 1840 it was the state capital.

BURLINGTON (*ante*), a city in Burlington co., N. J., on the Delaware 18 m. above Philadelphia, founded by Quakers in 1677. It is on the Camden and Amboy railroad, and is connected by steamboats with Philadelphia. Among its educational institutions are a college and St. Mary's hall for young women (both Episcopal). There is considerable manufacturing business, and trade by the river and railroads. B. was for a long period the seat of government of the colony of West Jersey, and the last official residence of Wm. Franklin, the governor, at which period and afterwards it had a lucrative West India trade. Pop. '80,7237.

BURLINGTON (*ante*), the chief city of Vermont, a port of entry, and the co. seat of Chittenden co., on lake Champlain, 38 m. by rail n.w. of Montpelier; pop. '80, 11,364. The harbor is commodious and safe, protected by a breakwater 900 ft. long; and the location of the city is remarkably fine, both for commerce and charming scenery. Besides the lake navigation, the Central Vermont, Vermont and Canada, Burlington and Lamoille, and Rutland and Burlington railroads give ample means of communication. There is a steam ferry to Plattsburg, N. Y. The lumber trade is the largest single business, but there are marble works, manufactories, and a large local trade. B. is connected with Winooski, a manufacturing suburb, by a bridge over the Winooski river. The university of Vermont, founded in 1791, is on the highest ground in the city; departments of the university are the agricultural college and a medical school. Another educational feature is the Vermont Episcopal institute, organized in 1858. The city is supplied with gas and water; its notable public buildings and institutes are: a U. S. custom house, a city hall, and a court house; 2 Congregational churches; 2 Roman Catholic; Unitarian, Baptist, Episcopal, and Methodist churches; the Fletcher free library; the Mary Fletcher hospital; Lake View cemetery, near lake Champlain, and Green Mount cemetery, overlooking the Winooski valley, the latter containing a creditable monument over the grave of Ethan Allen.

BURLINGTON. See BRIDLINGTON.

BURLINGTON LIMESTONE, a valuable material for building found in abundance near Burlington, Iowa, and elsewhere along the Mississippi, usually in double beds, the upper one nearly all carbonate of lime, and the lower one containing magnesia. This stone is peculiar for the vast abundance of fossils found in it, especially of crinoidea and corals.

BURMAH, EMPIRE OF, called also the EMPIRE OF AVA, an important kingdom of the Indo-Chinese peninsula, formerly of great extent; but by two contests with the British power in India, it lost several provinces, and is now, in its widest sense and including tributary states, comprehended between 19° 29′ and 28° n. lat., and 93° and 100° e. long., having an area of about 188,000 sq.m., and a scanty population estimated at from 3,000,000 to 4,000,000. It is bounded on the n. by mountains, separating it from Assam and Thibet; on the e., by China; on the s., by the British province of Pegu; and on the w., by Munnipore and mountain-ranges dividing it from Tipperah, Chittagong, and

Aracan. The Burman empire, as it now exists, has three well-marked divisions: 1. Northern B., inhabited chiefly by Singphos, Shans, and other tribes; 2. B. proper; 3. The Eastern Shan tributary states. The area of B. proper, from lat. 24° n. to the frontier of Pegu, is 44,450 sq.m., with a population of about 1,200,000.

Physical features.—From the eastern extremity of the great transverse mountain barrier of Northern India, longitudinal ranges strike away southwards, and between two of these the Burman territories are situated. The country slopes from the highland regions of the n. towards the coast, and has been fitly described as "a varied surface of rolling upland, interspersed with alluvial basins and sudden ridges of hill."

The principal river, the Irrawaddy (q.v.), having its source amid the snowy mountains from which descends the Brahmaputra, is the great commercial highway of the country, through the heart of which it takes its course. Passing Amarapura, Ava, and other towns, it enters Pegu, and 90 miles below Prome, divides into an eastern and western branch, the former flowing past Rangoon, the latter forming the Bassein river. The Kyen-dwen is its principal tributary. To the e. of the Irrawaddy, the Salween, after an almost parallel course, enters the British territories in nearly the same latitude.

Climate.—On the coast, only two seasons are known—the dry and the rainy, which are regulated by the n.e. and the s.w. monsoons; but in B. proper, less rain falls, and there are three seasons—the cold, the hot, and the rainy. Some showers fall in May or June, but the great rains last from the middle of Aug. to the end of Oct. The cool season is from the middle of Oct. till the beginning of April, and from this month till the great rains is the hot part of the year, the thermometer ranging from 85° to 100°. The climate is, on the whole, healthy, but the jungles are very pestiferous.

Minerals.—B. has vast fields of mineral wealth, but little enterprise and capital are brought to bear upon them. There are gold mines at Bamo, near the Chinese frontier. Auriferous sand is found in many of the streams. Silver is obtained at Bau-dwen, likewise on the confines of China, and also in the Shan country, from whence comes the chief supply of lead. Iron is quarried at Poukpa, a lofty mountain a few miles e. of Pagan. The celebrated ruby mines of B. are situated 60 or 70 m. n.e. from the capital and are jealously guarded. Sapphires of great size are found in the same stratum, but are more rare. The annual value of the gems is estimated at from £12,000 to £15,000 sterling, and they are the property of the king. Wells of the mineral oil, petroleum, are worked at Ye-nan-gyoung, on the Irrawaddy, above Prome. Marble, noble serpentine, and amber are likewise found in large quantities.

Vegetable productions.—A few only of the most striking of these can be noticed. Of the graceful palm-tribe (*palmaceæ*), the cocoa-nut, the betel, the palmyra, and the nipa, or water-palm, are the most prized. The useful bamboo is widely diffused. The teak, of which B. possesses inexhaustible forests, and the hopæa, are amongst the most valuable of the timber-trees. Forests of pine grow to the eastward of Amarapura. The wood-oil tree is found on the higher Salween, one trunk of which will produce from 30 to 40 gallons of oil every season. The staple fruit of the country is the plaintain or banana. The jack is prized by the natives. The mango reaches the height of 100 ft., and produces a delicious fruit. Rice, wheat, tobacco, indigo, and cotton are cultivated.

Animals.—The *felidæ*, or cat family, abound, tigers, leopards, and tiger-cats being met with in every part of the country. Of the *pachydermata*, the elephant and rhinoceros are the most noteworthy. The elephant, buffalo, and Indian ox have been domesticated.

Ethnology.—The Burmams belong to that branch of the Mongolidæ characterized by a monosyllabic language; they are short-headed, broad-skulled, and flat-faced. The hair is black, and the skin of a deep brown color. Their *dress* is simple, but peculiar. The *in-gie*, a white linen jacket, is common to both sexes. Wrapped around the lower part of the body, the men wear the *put-so*, which is several yards in length; the women, the *te-mine*, a scant garment of cotton or silk. Silks, muslins, and valuable gold ornaments are worn on special occasions. Betel-nut chewing and cigar-smoking are greatly practized by both men and women. The Burmans are, generally speaking, fine, well-made men, and excel in wrestling, boxing, rowing, foot-ball, and other athletic exercises; they are clever as carpenters and smiths. Burman houses are made of a framework of bamboo, thatched with the leaf of the water-palm, and are invariably raised on posts several feet from the ground. The women are more industrious than the men; they buy, sell, weave, and attend to the domestic concerns. Both sexes delight in merry-making, feasting, buffoonery, and sight-seeing. A *pooay*, or theatrical representation, is a very favorite amusement, and a buffalo-fight attracts crowds of spectators. The Burman has little patriotism, but is attached to his home. Without individual cruelty, he is indifferent to the shedding of blood by his rulers. Though temperate and hardy, he dislikes discipline and continued employment; and when in power, is too often arrogant, arbitrary, and corrupt.

Besides the true Burman, a great variety of races inhabit the Burman territories. The *Telaings*, or *Moans*, descendants of the ancient Peguans, are pretty well amalgamated with the Burmans. The *Shans*, or *Tai*, perhaps the most numerous and widely diffused of the Indo-Chinese peoples, are scattered over the peninsula, from Munnipore to Bangkok. Of the eastern Shan states, some are tributary to B., others to Siam, while those w. of the Irrawaddy are wholly under Burman rule. The *Singphos* cluster round

the mountains of the n., and along the western mountain-boundary of B., wild *Kyhens*, and many tribes under different names, live in varying degrees of civilization. The *Karens* are met with chiefly in southern Burmah.

Religion.—Buddhism (q.v.) is the prevailing religion of B., where it has been preserved in great purity. Its monuments—temples, shrines, and monasteries—are innumerable; its festivals are carefully observed, and its monastic system is fully established in every part of the kingdom. While directing the reader to the special article on BUDDHISM for an account of its doctrines, history, etc., we may here glance at its development, institutions, and edifices among the Burmans.

The members of the monastic fraternity are known in B. as *pon-gyees*, meaning "great glory;" but the Pali word is *rahan*, or holy man. The pon-gyees are not priests, in the usual acceptation of the term, but rather monks. Their religious ministrations are confined to sermons, and they do not interfere with the worship of the people. They are a very numerous class, living in monasteries, or *kyoungs*, and may at once be known by their yellow robes (the color of mourning), shaven heads, and bare feet. They subsist wholly by the charity of the people, which, however, they well repay by instructing the boys of the country. The kyoungs are thus converted into national schools. The vows of a pon-gyee include celibacy, poverty, and the renunciation of the world; but from these he may at any time be released, and return to a secular life. Hence, nearly every youth assumes the yellow robe for a time, as a meritorious act, or for the purpose of study, and the ceremony of making a pon-gyee is one of great importance. The ostensible object of the brotherhood is the more perfect observance of the laws of Buddha. The order is composed of five classes—viz., young men who wear the yellow robe and live in the kyoungs, but are not professed members; those on whom the title and character of pon-gyees have been solemnly conferred with the usual ceremonies; the heads or governors of the several communities; provincials, whose jurisdiction extends over their respective provinces; and, lastly, a superior general, or great master, who directs the affairs of the order throughout the empire.

No provision is made for religion by the government, but it meets with liberal support from the people. A pon-gyee is held in profound veneration; his person is sacred, and he is addressed by the lordly title of *pra* or *phra;* nor does this reverence terminate with his death. On the decease of a distinguished member, his body is embalmed, while the limbs are swathed in linen, varnished, and even gilded. The mummy is then placed on a highly decorated cenotaph, and preserved, sometimes for months, until the grand day of funeral. The Burman rites of cremation are very remarkable, but we cannot here enlarge upon them. On the whole, a favorable opinion may be passed on the monastic fraternity of B.; although abuses have crept in, discipline is more lax than formerly, and many doubtless assume the yellow robe from unworthy motives.

In B., the last Buddha is worshiped under the name of Gautama. His images crowd the temples, and many are of a gigantic size. The days of worship are at the new and full moon, and seven days after each; but the whole time, from the full moon of July, to the full moon of Oct., is devoted by the Burmans to a stricter observance of the ceremonies of their religion. During the latter month, several religious festivals take place, which are so many social gatherings and occasions for grand displays of dress, dancing, music, and feasting. At such times, barges full of gayly-dressed people, the women dancing to the monotonous dissonance of a Burman band, may be seen gliding along the rivers to some shrine of peculiar sanctity. The worship on these occasions has been described by an eye-witness, in 1857, as follows: "Arrived at the shrines and temples, the people suddenly turn from pleasure to devotion. Men bearing ornamental paper-umbrellas, fruits, flowers, and other offerings, crowd the image-houses, present their gifts to the favorite idol, make their *shek-ho*, and say their prayers with all dispatch. Others are gluing more gold-leaf on the face of the image, or saluting him with crackers, the explosion of which in nowise interferes with the serenity of the worshipers. The women for the most part remain outside, kneeling on the sward, just at the entrance of the temple, where a view can be obtained of the image within." On another occasion, we read: "The principal temple being under repair, was much crowded by bamboo scaffolding, and new pillars were being put up, each bearing an inscription with the name of the donor. . . . . The umbrellas brought as offerings were so numerous, that one could with difficulty thread a passage through them. Some were pure white, others white and gold, while many boasted all the colors of the rainbow. They were made of paper, beautifully cut into various patterns. There were numerous altars and images, and numberless little Gautamas; but a deep niche or cave, at the far end of which was a fat idol, with a yellow cloth wrapped round him, seemed a place of peculiar sanctity. This recess would have been quite dark, had it not been for the numberless tapers of yellow wax that were burning before the image. The closeness of the place, the smoke from the candles, and the fumes from the quantity of crackers constantly being let off, rendered respiration almost impossible. An old pon-gyee, however, the only one I ever saw in a temple, seemed quite in his element; his shaven bristly head and coarse features looking ugly enough to serve for some favorite idol, and he seemed a fitting embodiment of so senseless and degrading a worship. Offerings of flowers, paper-ornaments, flags, and candles were scattered about in profusion. The beating a bell with a deer's horn, the explosion of crackers, and the rapid mutter-

ing of prayers, made up a din of sounds, the suitable accompaniment of so misdirected a devotion."

The rosary is in general use, and the Pali words *aneitya! doka! anatta!* expressing the transitory nature of all sublunary things, are very often repeated. The Burman is singularly free from fanaticism in the exercise of his religion, and his most sacred temples may be freely entered by the stranger without offense; indeed, the impartial observer will hardly fail to admit that Buddhism, in the absence of a purer creed, possesses considerable influence for good in the country under consideration. "It teaches man to combat, control, and master the passions of his heart, to make reason predominate over sense, mind over matter, and to practice the virtues required for the attainment of these objects."

The sacred edifices are of three kinds: 1. The tope, dagoba, or *shrine* (*zadee* or *tsadee*), a monument erected to the last Buddha, is a solid, bell-shaped mass of plastered brickwork, tapering to the summit, which is crowned by the *tee*, or umbrella, of open ironwork. 2. The *temple*, in which are many images of Gautama. The most remarkable specimen of Burman temple-architecture is the *ananda* of Pagan. The ground-plan takes the form of a perfect Greek cross; and a tapering spire, with a gilded tee at the height of 168 ft. from the foundation, crowns the whole. 3. The *kyoung* or monastery (*vihara*) is generally constructed with a roof of several diminishing stages, and is often elaborately adorned. Burman architecture "differs essentially from that of India in the frequent use of the pointed arch, not only for doors and windows, but also in the vaulted coverings of passages."

Cities.—Mandalay, the present capital of B., and seat of royalty, is situated 3 m. from the Irrawaddy, a little to the n. of Amarapura and Ava. It is laid out in three parallelograms, one within another, of which the inner two are walled; the palace occupies the center. Ava and Amarapura, each at one time the capital of the empire, are now almost entirely deserted. Pagan represents the past of B., and is remarkable for its magnificent ruins of temple-architecture, extending over 8 sq.m.; the prevailing type is the cruciform vaulted temple.

Government.—The government of B. is a pure despotism, life and property being at the mercy of the reigning sovereign. Many instances of the cruel abuse of arbitrary power, by even recent kings, might be given. The present monarch is, however, mild, approachable, and apparently desires the welfare and happiness of his subjects. The *lot-dau*, or high court of council, is composed of the four *woon-gyees*, or principal ministers of state. The *atwen-woons*, or household ministers, are likewise four in number. They receive the royal commands, and are in close attendance upon the king. The *woon-douks* are a third order of ministers, and act as assistants to the woon-gyees. The decisions of the lot-dau, when sanctioned by the king, become law. The *Dam-a-that*, a Burman translation of the *Institutes of Menu*, is also in force. White umbrellas and white elephants are regarded as insignia of royalty. The "lord white elephant," indeed, is looked on as an estate of the realm, a mark of universal sovereignty, and a sacred being. It has a palace, a minister, and numerous attendants.—The *military power* of the country is not great, and of musketeers it is probable that the king could not command more than 18,000.

The *civilization* of B., if not retrograde—which the ruins of Pagan would almost seem to indicate—is stationary and stereotyped, like that of China. All the wealth of the country is lavished on the sacred edifices, £10,000 sterling being sometimes expended on the gilding and beautifying of a single shrine or temple, whilst roads, bridges, and works of public utility are neglected.

The *vernacular tongue* of B. belongs to the monosyllabic class of languages, and is without inflection; the character is formed of circles and segments of circles. It is engraved on prepared strips of palm-leaf, and a number of these form a book. Printing is unknown, except where introduced by the missionaries. *Pali* is the language of the religious literature.

Commerce.—Since B. was deprived of its harbors and maritime districts, its foreign commerce has been very limited. The principal exports (from B. proper) consist of Sesamum oil, teak-timber, petroleum, sweet-oil, tobacco, lackered boxes, gold leaf, silver, lead, copper, stick-lac, indigo, cocoa-nuts, ponies, wheat, pulse, and cotton. The imports (into the Burman empire) are *ngapee* (a paste of rank pickled fish, which is eaten with rice, the staple food of the Burman), paddy, rice, dried fish, salt—all these being imported by thousands of tons annually—cotton piece-goods, silk do., and woolens. B. carries on an overland traffic with China, exporting cotton and importing silk. A commercial treaty with Britain was concluded in 1867, but has remained almost a dead letter.

The standard *currency* of B., called *yowet-ni* (red-leaf), is silver, but there is no coinage. This metal is used, however, of varying degrees of purity, which complicates mercantile transactions, and assayers are employed to find the value of the metal.

History.—Of the early and mythical history of B., nothing need here be said. The kingdoms of Ava and Pegu long contended for mastery. The latter was in its zenith in about 1580 A.D. Passing on to 1752, it appears that the Peguans, after a period of subjection, obtained the advantage. At this time, however, Alompra, or *Aloung Pra*, the most celebrated warrior-king in Burman history, rose to power, founded the present

dynasty, subdued the Peguans, and incorporated their country, as well as many neighboring states, with his own. The Burman empire attained its greatest expansion in 1822. The wars of 1822–24 and 1852, with the British, reduced B. to its present limits. The savage excesses of the king of B. led in 1879 to the withdrawal of the British ambassador and his staff. See Yule's *Narrative of the Mission in* 1855; Fytche's *Burma Past and Present* (1878); Winter's *Six Months in B.* (1858); Capt. Bower's *Bhamo Expedition* (1869); Vincenti's *Land of the White Elephant* (1874); Gordon's *Burmah and its Inhabitants* (1876); Anderson's *Mandalay to Momien* (1876); M'Mahon's *The Karens and the Golden Chersonese* (1876).

BURMAH, British, includes the three maritime provinces of India beyond the Ganges, which were united under one local administration in 1862. It extends along the eastern side of the bay of Bengal, from 20° 50′ to 10° 50′ n. lat. It has a coast-line of fully 900 English m., and a total area of 88,556 sq.m., distributed as follows: Aracan, 14,526; Pegu, 27,300; Tenasserim, 46,730.

The whole of this territory was taken from the king of Burmah in the two wars provoked by him.

Akyab, Rangoon, and Maulmain are the principal seaports of Aracan, Pegu, and Tenasserim respectively. Pegu is the most prosperous of these three divisions, and has made the most progress within recent times. Pop. of B. '72, 2,747,148. The Burmans (including Aracanese and Talcins, or Peguens) number about two millions. Of the other races—Karens, Shans, Chinese, and Hindus—the Karens are the most numerous and interesting.—Report by lieut.col. sir A. P. Phayre, etc.

BURMANN, Peter, the most important member of a Dutch family celebrated for learning, was b. at Utrecht 1668, studied law at the university of that city and of Leyden, and, after taking his degree in 1688, traveled through Germany and Switzerland. After practicing as an advocate for some years, he was appointed professor of history and rhetoric in the university of Utrecht; which office he subsequently exchanged for the professorship of Greek. In 1715, after the death of Perizonius, he removed to the university of Leyden, where he died 31 Mar., 1741.

His literary career was very active, and his hot temper and intolerant spirit involved him in many controversies. Among his most distinguished adversaries were Le Clerc and Bentley. His chief works are editions of the Latin classics—Petronious, Velleius Paterculus, Quintilian, Valerius Flaccus, Phædrus, Ovid, the Poëtæ Minores, Suetonius, Lucan. The first of these appeared in 1709, and the last in 1740. They are characterized less by taste and critical acumen than by learning, fullness, and beauty of type.

BURMEISTER, Hermann, b. 1807; a German naturalist; studied medicine and natural history, and in 1842 was appointed professor of zoology in the university of Halle. In 1848, he was a deputy to the Frankfort assembly, and afterwards a representative in the first Prussian chamber. In 1850, he made a survey in Brazil in the interest of science, and visited other parts of South America a few years later. He has published many elaborate works on natural history, travels, etc.

BURMESE WARE, small cups, etc., made of strips of bamboo woven like fine basket work, the interstices being filled with paste made of wood-oil and fine powders, and when sufficiently hardened the surface smoothed with pumice-stone and water. Sometimes they are ornamented with pictures worked in with the varnish

BURN, Richard, was b. in 1720 at the village of Winton, in Westmoreland. After being educated at Queen's college, Oxford, he received the living of Orton, in his native county, which he continued to hold until his death in 1785. He is widely known as the compiler of two very useful law-books, the *Justice of the Peace* and *Ecclesiastical Law*, which have each passed through many editions. He also published a *History of the Poor Laws*, an edition of Blackstone's *Commentaries*, and several sermons and works of a religious nature.

BURNABY, Frederick. See page 883.

BURNAND, Francis Cowley. See page 884.

BURNAP, George Washington, d.d., 1802–1859; a graduate of Harvard and pastor of the First Independent church of Baltimore from 1828 until his death. He was the author of many volumes on religious themes, lectures, a life of Calvert, governor of Maryland, etc.

BURNE-JONES, Edward. See page 884.

BURNES, Sir Alexander, a distinguished traveler in Central Asia, was b. at Montrose, in Scotland, 1805, where his father, who was a cousin of Robert Burns the poet, was an active magistrate. He early entered the Indian army, and his knowledge of oriental languages gained him rapid promotion. After performing some important missions for the Indian government, he was, at his own suggestion, sent on an expedition into Central Asia. Starting from Lahore on the 11th Feb., 1832, B., having adopted the dress and usage of the Afghans for greater safety, passed through Peshawur and Cabul, and, crossing the Indian Caucasus, reached Balkh on the 9th June. Thence he passed on to Bokhara, Astrabad, and Teheran, and journeying through Ispahan and Shiraz, reached Bushire on the Persian gulf, from whence he embarked for India. He received the special thanks of the governor-general for his travels; and on his return to England in 1833, he received a warm welcome from the India house and board of control, and was highly honored by the royal geographical and other societies. In Sept.,

1839, having previously, for his important services, been knighted and promoted to the rank of lieut.col., he was appointed political resident at Cabul, where he was murdered on the breaking out of the insurrection in that city in Nov., 1841—a tragedy re-enacted in 1879, when sir Louis Cavagnari, newly appointed resident in Cabul, was massacred, with his staff and guards. B. was author of *Travels into Bokhara* and a work on *Cabul*.

BURNET, the English name of two genera of plants, *sanguisorba* and *poterium*, belonging to the natural order *sanguisorbeæ* (q.v.).—very generally regarded as a suborder of *rosaceæ*—which have much resemblance to one another, and receive a common name also in other languages. *Sanguisorba* has hermaphrodite flowers with four stamens; in *poterium*, the flowers are polygamous, and the stamens indefinite in number. In both, the calyx is 4-fid, and the corolla wanting. GREAT B. (*sanguisorba officinalis*) is common in meadows in all parts of Europe, and not unfrequent in some parts of England, particularly where the soil is calcareous. It has a stem 1 to 2 ft. high, pinnate leaves, with about four pair of ovate serrated leaflets and an odd one; the flowers are crowded in dark red spikes. It is cultivated in Germany for feeding cattle, and is much esteemed for this use, as it grows well even on very poor soils, and the produce is abundant. Cattle are very fond of it. The root is astringent, and was formerly used in medicine. COMMON B. (*poterium sanguisorba*) grows in sunny places on hills in the middle and south of Europe, and is common in England, especially in the chalk districts. In habit and foliage, it much resembles the Great B., but the leaflets are smaller and the flowers are in heads of a dull purplish color. It has been much cultivated in some parts of England as a substitute for clover on chalky soils, and is relished by cattle. It forms great part of the natural pasture of the South Downs, and of the excellent sheep-walks of Salisbury plain. It is regarded as a plant particularly suitable for poor arid soils. It is sometimes cultivated in gardens, and its leaves, which are slightly astringent, are used in salads or soups. They are said to form one of the ingredients of the famous *cool tankard*, and the name *poterium* is from Greek word signifying a drinking vessel.—Both this and the preceding are perennial plants.—There are several other species both of *sanguisorba* and *poterium*, some of the latter shrubby, natives chiefly of the warmer temperate parts of the world.

BURNET, a co. in central Texas, on the Colorado river; 995 sq.m.; pop. '70, 3688—358 colored; in '80, 6855. The surface is hilly and rocky, with fertile soil. Marble of various colors, limestone, coal, iron, and petroleum are found. Agriculture is the main business. Co. seat, Burnet.

BURNET, GILBERT, bishop of Salisbury, was b. at Edinburgh, on the 18th Sept., 1643. He was educated at home, and afterwards at Marischal college, Aberdeen, where he pursued his studies so diligently, that he took his degree of M.A. before he was 14. In the course of a year he made up his mind to enter the church, and read so hard at theology, that in less than three years he had mastered the chief systems of divinity, besides having gone over the Old and New Testaments in the original, with all the commentaries of note in his time. In 1663, he visited Cambridge, Oxford, and London, where he met with many of the leading divines of England. Next year, he passed over into Holland and perfected his knowledge of Hebrew under a learned rabbin of Amsterdam. In 1665, he was presented to the parish of Saltoun, where he remained five years. In 1669, he was appointed professor of divinity in the university of Glasgow, but having mixed himself up in the politico-ecclesiastical affairs of the time, he brought upon himself the enmity of Lauderdale, and found it prudent to resign his chair in 1674. He now removed to London, and was made preacher at the Rolls' chapel by sir Harbottle Grimston, and afterwards lecturer at St. Clement's. In 1676, he published his *Memoirs of the Dukes of Hamilton*, and in 1679, the first volume of his *History of the Reformation*, which procured him a vote of thanks from both houses of parliament. Next year appeared *Some Passages in the Life and Death of the Earl of Rochester*, in which B. records the religious interviews which he had with that profligate nobleman during his last illness, and which led to the latter's conviction of the truth of Christianity. In 1681, he published the second volume of his *History of the Reformation*, and in 1682 his *Life of Sir Matthew Hale*. The efforts which had previously been made, were now repeated, to induce him to break with the liberal and moderate party, and to attach himself to the king. He was offered the bishopric of Chichester, but refused it. In 1683 he narrowly escaped being brought into trouble in regard to the Ryehouse plot. He conducted the defense, attended the execution, and vindicated the memory of his friend lord William Russell. The king exhibited his unkingly spite by depriving B. of his St. Clement's lectureship. On the accession of James II., he went to the continent, and traveled through France, Italy, Switzerland, and Germany. In 1684, he was introduced to the prince of Orange, with whom he became a great favorite, and by whom he was frequently consulted in reference to the great scheme for the deliverance of England. When William came over, B. accompanied him in the capacity of royal chaplain, and shortly after, was appointed bishop of Salisbury. He entered on the duties of his diocese with great ardor; but his first pastoral letter, in which he founded the right of William to the throne on conquest, gave so much offense to both houses of parliament, that they ordered it to be burned by the hands of the common hangman. William, however, who

knew the excellent qualities of the bishop, was not greatly impressed by this solemn performance, and continued to trust B. to the end of his life. In 1698, B. was appointed preceptor to the duke of Gloucester; in 1699, he published his celebrated exposition of the 39 articles, which was condemned as heterodox by that not very competent assembly, the house of lords. In 1714, appeared the third volume of his *History of the Reformation.* In the spring of 1715, he was attacked by a pleuritic fever, and carried off on the 17th of Mar., in the 72d year of his age. B. was thrice married: his first wife was remarkable for her beauty; the second, for her fortune; and the third, for her piety.

Soon after B.'s death, appeared *Bishop B.'s History of his Own Time, from the Restoration of King Charles II. to the Conclusion of the Treaty of Peace at Utrecht, in the Reign of Queen Anne.* It was sarcastically but foolishly abused by the tory writers of the day—Swift, Pope, Arbuthnot, and others. B. was a man of strict, almost of puritanic virtue; yet his charity, geniality, and moderation of sentiment might be imitated with advantage even in our own day. His style is neither elegant nor correct, and his judgment is not always reliable, yet the honesty, earnestness, simplicity, and vigor of his writings, as well as their fullness of details, make his works very valuable to the student of history.

BURNET, Jacob, ll.d., 1770–1853; a graduate of Princeton, and one of the early settlers of Cincinnati; judge of the Ohio supreme court in 1821, and U. S. senator in 1828. He published *Notes on the Early Settlement of the North-west Territory.*

BURNET, John, a painter, engraver, and author, was b. at Fisherrow, near Edinburgh, Mar., 1784. He was first brought under the notice of the public through his engravings of Wilkie's works, which he executed in a most admirable manner. Of his own paintings, the best known engraving is that of "Greenwich Pensioners receiving News of the Battle of Trafalgar." He has written several works on art, illustrated by drawings and engravings of his own, the most important of which is a *Practical Treatise on Painting.* He is also the author of *Rembrandt and his Works,* 4to, 1849; and in conjunction with Mr. Peter Cunningham, of *Life and Works of J. M. W. Turner,* 1852. He died in 1868.

BURNET, Thomas, best known from his *Theory of the Earth,* was b. in Yorkshire, 1635, and studied at Cambridge. After acting as traveling tutor to several noblemen, he was elected master of the charter-house (1685), and later, succeeded archbishop Tillotson as clerk of the closet to William III. But having (1692) published a work, *Archæologiæ Philosophicæ, sive Doctrina Antiqua de Rerum Originibus* (also in English), displaying great learning, but treating the Mosaic account of the fall as an allegory, he was obliged to retire from the clerkship, and lived in the charter-house till his death, in 1715. His *Telluris Theoria Sacra* (first part, 1680; second, 1689) was written in Latin, but translated, or rather recomposed in English, by the author. It is an ingenious speculation, written in ignorance of the facts of the earth's structure, and is therefore a mere system of *cosmogony,* and not geology. But it abounds in sublime and poetical conceptions and descriptions, conveyed in language of extraordinary eloquence, and called forth the highest applause at the time.

BURNETT, a co. in n.w. Wisconsin, on the St. Croix river, 1100 sq.m.; pop. '80, 3140. Co. seat, Gordon.

BURNETT, Frances Eliza Hodgson. See page 884.

BURNETT, Waldo Irving, 1828–54; a naturalist and microscopist; b. Mass. He did a great amount of microscopical work within the five years preceding his death. His chief publication was a prize essay on *The Cell, its Physiology, Pathology, and Philosophy, deduced from Original Observations; to which is added its History and Criticism.*

BURNETT PRIZES, The, are two theological premiums, founded by Mr. Burnett of Dens, Aberdeenshire. This gentleman (b. 1729—d. 1784) was a general merchant in Aberdeen, and for many years during his lifetime spent £300 annually on the poor. On his death, he bequeathed the fortune he had made to found the above prizes, as well as for the establishment of funds to relieve poor persons and pauper lunatics, and to support a jail chaplain, in Aberdeen. He directed the prize fund to be accumulated for 40 years at a time, and the prizes (not less than £1200 and £400) to be awarded to the authors of the two best treatises on "The evidence that there is a Being all-powerful, wise, and good, by whom everything exists; and particularly to obviate difficulties regarding the wisdom and goodness of the Deity; and this independent of written revelation, and of the revelation of the Lord Jesus; and from the whole to point out the inferences most necessary and useful to mankind." The competition is open to the whole world, and the prizes are adjudicated by three persons appointed by the trustees of the testator, together with the ministers of the established church of Aberdeen, and the principals and professors of King's and Marischal colleges, Aberdeen. On the first competition in 1815, 50 essays were given in; and the judges awarded the first prize, £1200, to Dr. William Lawrence Brown, principal of Marischal college and university of Aberdeen, for an essay entitled *The Existence of a Supreme Creator;* and the second prize, £400, to the Rev. John Bird Sumner, afterwards archbishop of Canterbury, for an essay entitled *Records of Creation.* On the second competition, in 1855, 208 essays were given in; and the judges, Rev. Baden Powell, Mr. Henry Rogers, and Mr. Isaac Taylor, awarded the first prize, £1800, to the Rev. R. A. Thompson, Lincolnshire, for an essay entitled *Christian Theism;* and the second prize, £600, to the Rev. Dr. John Tulloch, principal of St. Mary's college, St. Andrews, for an

essay on *Theism*. The above four essays have been published in accordance with Mr. Burnett's deed. It is expected that £10,000 will be available in 1895.

BURNETT'S DISINFECTING LIQUID AND **ANTISEPTIC FLUID** is a liquid introduced by sir W. Burnett for the purpose of deodorizing the bilge-water of ships, sewerage-water, etc. It is a strong solution (sp.gr. 2) of chloride of zinc, accompanied by a small amount of chloride of iron; and when intended to be used, it is mixed with water in the proportion of one pint to five gallons of water. The liquid acts only as a *deodorizer* and *antiseptic* (see ANTISEPTICS), and does not yield any vapor which can exhibit the properties of a disinfectant (q.v.). It is of service in preserving dead animal tissues, as in the dissecting-room, and in jars containing anatomical specimens. It has little action on knives or steel instruments. When added to bilge or sewerage water, the chloride of zinc (ZnCl) mainly acts by decomposing the offensive sulphide of ammonium (NH_4S), which it does by forming the sulphide of zinc (ZnS) and chloride of ammonium (NH_4Cl), both of which are odorless. The strong solution of chloride of zinc has also been applied to the preservation of timber, and the process of so treating wood is called, after its inventor, *Burnettizing*. *Crewe's* disinfectant liquid is chemically the same as the above.

BURNEY, Dr. CHARLES, a musical composer, celebrated as the author of the *General History of Music*, was b. at Shrewsbury, 1726. Having studied music in his native city, in Chester, and under Dr. Arne in London, he commenced giving lessons in music himself. After composing three pieces—*Robin Hood*, *Alfred*, and *Queen Mab*—for Drury Lane, B. London, and settled at Lynn, in Norfolk, where he designed his work on the *History of Music*. In 1770–72, he traveled in France, Italy, the Netherlands, and Germany, collecting materials for his proposed work, and published an essay on the *Present State of Music in France and Italy*, etc. (2 vols., Lond. 1772). This was followed by his *General History of Music from the Earliest Ages to the Present Period* (4 vols., Lond. 1776–89.) Besides other minor works, B. wrote a *Life of Handel*, and nearly all the musical articles in *Rees's Cyclopædia*. He was appointed organist to the hospital at Chelsea in 1789. He died in 1815. He was intimately acquainted with many of the most eminent men of the day, including Edmund Burke and Dr. Johnston.—His second daughter, FRANCISCA B. (afterwards Madame D'Arblay), became distinguished as authoress of *Evelina*, *Cecilia*, *Georgina*, and *Camilla*—novels formerly very popular, and still retaining some interest.

BURNEY, FRANCES (Madame D'Arblay). See BURNEY, Dr. CHARLES, *ante*.

BURNING GLASSES AND **MIRRORS**. See HEAT, LENS, and MIRROR.

BURNLEY, a thriving t. and parliamentary borough in Lancashire, situated in a narrow vale on the banks of the Brun, a mile and a half above its junction with the North Calder, and 24 m. n. of Manchester. Pop. '81, of p. b., 63,502. It has manufactures of cottons and woolens, calico-printing works, iron and brass foundries, machine-making works, breweries, tanneries, and rope-works. There are collieries in the vicinity, and traffic is faciliated by railways and canals, which unite it with the principal centers of trade in Lancashire and Yorkshire. B. returns one member to parliament.

A Roman vicinal way passed through the town, part of which is still known and used as the "Long Causeway." Roman coins, pottery, urns, etc., have been found near the town, and an extensive series of beacons, encampments, dikes, etc., occupy the slopes of the hills in the neighborhood for a linear distance of more than 10 miles. From the name of the river, *Brun*, and other circumstances, these slopes are supposed to furnish a very probable site for the battle of Brunnanburh, so celebrated in Saxon history.

BURNOUF, EUGENE, one of the most distinguished orientalists of modern times, was b. at Paris, April 1, 1801, and after entering on the study of law, betook himself to the oriental languages, especially those of India and Persia. In conjunction with prof. Lassen of Bonn, he published, in 1826, *Essai sur le Pali*, which was followed, in 1827, by *Observations Grammaticales sur quelques Passages de l'Essai sur le Pali*. His great aim, however, at this time, was to obtain a complete knowledge of the remains of the religious literature in the Zend, or old Persic language, which had been neglected since the time of Anquetil du Perron, or, at least, not philologically and critically examined. B. undertook to decipher those curious MSS. which Anquetil du Perron had brought home with him, and which lay unregarded in the *Bibliothèque Impériale*. He commenced by causing the *chef-d'œuvre* of old Persic literature, the *Vendidad-Sadé* (one of the books of Zoroaster), to be lithographed with great care, and published from time to time in the *Journal Asiatique* the brilliant results of his laborious studies, which drew upon him the regard of the learned world. In 1834, he published the first volume of his *Commentaires sur le Yaçna l'un des Livres Liturgiques des Perses*, a work which, for the first time, rendered possible a knowledge not only of the dogmas, but also of the language of Zoroaster. It is a masterpiece of conscientious industry, united with copious lingual and antiquarian lore. His studies in the Zend language induced him to make an attempt to decipher the cuneiform inscriptions of Persepolis, in his *Mémoire sur deux Inscriptions Cunéiformes* (Par. 1836). In 1840, he published the text along with a translation of the *Bhâgavat-Purâna*, a system of Indian

mythology and tradition. As the fruit of his study of the Sanscrit books of the Buddhists, appeared in 1845 the *Introduction à l'Histoire du Boudhisme.* See BUDDHISM. This great work absorbed for six years the whole energies of B., who was now the recognized successor of Silvestre de Sacy. It is to be regretted that death did not permit him to continue his labors further. He died May 28, 1852.

BURNS, FRANCIS, D.D., 1809–63; b. in New York; a colored preacher who became a bishop of the Methodist Episcopal church. In 1834, he was a missionary in Liberia, where, in 1851, he founded the Monrovia academy.

BURNS, Rev. JABEZ, D.D., a Baptist minister, and one of the most prolific religious writers of the 19th c., was b. at Oldham, near Manchester, in 1805, and was educated at Chester, and afterwards at Oldham grammar-school. After helping his father as a medical practitioner, and acting as assistant in a drapery establishment, he joined the Methodist New Connection, and removed at the age of 21 to London. In 1828 and 1829, he published his first two works, *The Christian Sketch-book* and *The Spiritual Cabinet*, which gained him much popularity among the religious public. After having exercised the functions of the ministry at Perth, in Scotland, for a few years, he returned to London in 1835, to become minister of the General Baptist congregation assembling in New Church street chapel, Marylebone. Here his fame increased so much, that it was found necessary twice to enlarge his chapel during the first 25 years of his ministry, in order to afford room for the large numbers who flocked to hear him. He was elected by the body to which he belonged to fill various posts of honor, and lectured in all parts of the United Kingdom on temperance, peace, abolition of capital punishment, etc. In 1839, Dr. B. became editor of the *Temperance Journal.* About 1846, he received the degree of D.D. from the Wesleyan university of Middleton, Conn. Meantime his pen had not been idle, the number of his separate works being upwards of 30, some of them consisting of a number of volumes, and one of them, *Sketches and Skeletons of Sermons*, of 15 vols., having reached the 14th edition. The following are the names of a few: *Christian Exercises for every Lord's Day* (1858); *Christian Philosophy* (1849); *Deathbed Triumphs of Eminent Christians; Light for the House of Mourning* (1850); *Pulpit Cyclopædia*, 4 vols. (1846–60); *Marriage Gift-book and Bridal Token* (1862); etc., which are all highly popular among a large section of the English and American evangelical religious world. Dr. B. died in 1876.

BURNS, ROBERT, the great lyric poet of Scotland, was b. 25th Jan., 1759, in a small cottage near Ayr. His father, then a nursery-gardener, and afterwards the occupant of a small farm, had to struggle all his life with poverty and misfortune, but made every exertion to give his children a good education; and the young poet enjoyed an amount of instruction and miscellaneous reading which, to those unacquainted with the habits of the Scottish peasantry, would seem incompatible with the straitened circumstances and early toil which were his lot. About his 16th year, he began composing verses in the Scottish dialect, which attracted notice in the vicinity, and extended the circle of his acquaintance; and thus he became exposed to temptations which, acting on an extremely sociable and passionate disposition, broke in upon the previous sobriety and correctness of his life. A small farm, on which he had entered with his brother in 1781, proved far from a prosperous undertaking; and being harassed and imbittered by other misfortunes—the results of imprudence—he resolved to leave his native land, and go to Jamaica. Partly to procure the means of paying his passage, he published a collection of his poems at Kilmarnock in 1786. The reception these met with was highly favorable, and his genius was recognized in quarters where he had not looked for notice. While preparing to embark, he received a letter encouraging him to go to Edinburgh, and issue a new edition. This was the turning-point of his life. During his stay in the Scottish metropolis, he associated with all that was eminent in letters, rank, and fashion, and his conversational powers excited little less admiration than his poetry. The profits of the publication were considerable, and enabled him to take the farm of Ellisland, near Dumfries, where he settled in 1788, having publicly ratified his marriage with Jean Armour. With his farm he conjoined the office of an exciseman; but after 3 or 4 years, he was obliged to give up farming, and from that time lived in Dumfries, dependent on his salary from the excise, which, at first, only £50, never rose above £70. The striking contrasts in the lot of the rich and the poor with which his residence in Edinburgh had impressed him, made him hail the French revolution with enthusiasm; and some imprudent expressions of his having been reported to the authorities, destroyed his prospects of promotion in the service, and only the interference of an influential friend prevented him from losing his office. Such was then the terror of innovation, and the hatred of everything like liberal opinions, that many of the better classes, who had fêted the poet, now shunned the "Jacobin," as they stigmatized him. Imbittered by what he felt to be injustice, he recklessly allowed those habits of dissipation to grow upon him which made the more respectable of all classes look coldly on him; and the remorse thus occasioned in his calmer moments aggravated that tendency to melancholy which the gloom and toil of his early years had probably implanted in his constitution. Broken in health, he died 21st July, 1796.

The poetry of B. is purely the outpouring of the moment—the response of the feelings to the immediate circumstances of life. Its charm and power lie in the justness

of the feelings expressed, and in the truthfulness and freshness which it derives direct from life. Seldom have such manliness, tenderness, and passion been united as in the songs of Burns. They formed the first awakening of the spirit of true poetry in Britain after a long slumber. The popularity that B. instantly acquired has continued unabated, not only in his native Scotland, but wherever English is spoken; his poems have also been translated into almost every European tongue. Dr. Currie, of Liverpool, published the first collected edition of his poems and letters, with a life (4 vols., Lond., 1800). Several more complete collections have appeared since, such as that by Allan Cunningham (8 vols., Lond. 1834), and that by Mr. Scott Douglas, of which the first volumes appeared in 1877. A life of B., by Lockhart, appeared, Edin. 1828. In *The Life and Works of Burns* (Edin. 1851–52), by R. Chambers, the poems are incorporated in the narrative in chronological order.

In 1859, the centenary of B.'s birth was celebrated with unparalleled enthusiasm, not only in every city and almost in every village of Scotland, but in the chief cities of England, and throughout America, the British colonies, and India.

BURNSIDE, Ambrose Everett, b. Ind., 1824; a graduate of West Point, serving in the army until 1853, when he resigned and established in Rhode Island a factory for making a breech-loading rifle of his own invention. In the civil war he served as colonel, and brig. and maj.gen. of volunteers, and was in many important engagements. He resigned at the close of the war, and in 1866 was chosen governor of Rhode Island; was re-elected twice afterwards; in 1875 became U. S. senator. He d. 1881.

BURNSIDE, John. See page 884.

BURNS and **SCALDS** are injuries to the surface of the living body arising from excessive heat—a scald implying that the heat proceeded from a fluid medium, as boiling water; a burn, from a solid. The injury is much the same in both cases; therefore the directions for the treatment of burns will be applicable also to scalds. These injuries may be divided into three classes: 1. Burns resulting in simple redness of the skin; 2. Burns resulting in vesication or blistering; 3. Burns resulting in sloughing, or death of the part. The first object, after the accident has occurred, is to relieve the suffering; and cold applied either in the form of ice or water seems in most cases to have almost a specific power in allaying pain and checking the advance of inflammation. In other cases, moderate warmth is found more efficacious, and we must be guided mainly by the sensations of the sufferer as to which of these remedies we make use of. In very severe cases, opium or chloroform may be employed. But if the injury the body has received be very serious, the patient complains less of pain than of cold; he shivers, is much depressed, and must be well supplied with stimulants, to prevent his dying from the shock.

The best local application is the Carron-oil, which derives its name from the famous ironworks, where it has been used for many years. It consists of equal parts of olive-oil and lime-water, and should be applied on linen rags or cotton-wool. Blisters may be pricked, and the contained serum allowed to trickle away, but on no account is the raised skin to be removed. The dressings should not be changed oftener than cleanliness requires; and as each portion of the old dressing is removed, it must at once be replaced with fresh, so that as little exposure as possible of the burnt surface may take place. The main principle of treatment is exclusion of the air from the injured part; and so long as this is effected, it matters but little what remedial agent is employed. Great care must be taken in the treatment of a sore resulting from a burn, that the contraction of the scar does not cause distortion of the neighboring parts.

When the clothes catch fire, the person should lie down on the floor, and roll herself, or be rolled, in the rug, table-cover, or anything sufficiently voluminous to stifle the flames; and afterwards the clothes, especially stockings, should be removed with great care, lest the cuticle should separate with them, which would materially increase the sufferings of the patient.

Extensive scalds or burns are very fatal to young children; and it must be remembered that their skin is more susceptible to external impressions, and will suffer from a degree of heat innocuous to an adult. Infants have frequently been scalded to death in too hot baths, or by too hot fomentations. The principles of treatment for burns produced by the contact of chemical agents to the skin, are the same as those for burns by fire.

BURNTIS'LAND, a seaport t. of Fifeshire, on the n. shore of the firth of Forth, about 8 m. n.n.w. of Edinburgh. It consists of one long street, clean and well kept, with a back street running parallel, and some diverging lanes. B. is an important station of the North British railway, having a steamboat ferry connecting it with Granton, the station on the opposite side of the Forth. It has a commodious harbor, which was greatly improved in 1876, and dock. Its trade consists principally of distilling, and the shipping of coal and iron; and in summer it is considerably resorted to as a convenient watering-place. It unites with Kinghorn, Dysart, and Kirkcaldy to send one member to parliament. Pop. '71, 3422.

BURNT OFFERING. See Sacrifice.

BURNT SIËNNA, a fine orange-red pigment, transparent and permanent, used both in oil and water-color painting. It is obtained by simply burning the ferruginous

ochreous earth known as Terra di Sienna. Excellent greens are produced by mixing it with Prussian blue. It mixes well with other pigments generally, and dries quickly.

BURNT STONES, antique carnelians found in ruins, and seeming to have been acted upon by fire, having a dull appearance externally, but exhibiting a beautiful red color when held up to the light. They are sold at a very high price, particularly if to the natural beauty of the stone is added the merit of fine workmanship. They were once, however, more esteemed than now, and an imitation of them, by burning the upper surface of carnelians with a hot iron, was very fashionable.

BURNT UMBER, a pigment of a russet-brown color, is semi-transparent, mixes well with other pigments, and dries quickly. It is obtained by burning umber, an ochreous earth containing manganese, and deriving its name from the place where it was first discovered—Umbria, in Italy.

BURNUG'GUR, a t. of India, in Guzerat, the territory of the Guicowar, 52 m. n. from Ahmedabad, in n. lat. 23° 48′, e. long. 72° 38′. It is a place of considerable trade, which is mostly in the hands of wealthy Brahmans. Pop. 12,000.

BUR OAK, *Quercus macrocarpa* (Michx.), a valuable tree for timber, found in the Atlantic and western states; sometimes called the mossy-cup oak.

BURR, Aaron, 1716–57; a Connecticut teacher and clergyman; in 1738, pastor of the Presbyterian church in Newark, N. J., and in 1748 second president of the college of New Jersey. He published a Latin grammar, several sermons, and *The Supreme Deity of Our Lord Jesus Christ Maintained.* His wife was a daughter of Jonathan Edwards.

BURR, Aaron, son of the clergyman Aaron Burr; b. N. J., Feb. 6, 1756; d. N. Y., Sept. 14, 1836. He was left an orphan before the age of three; graduated at Princeton in 1772; in 1775, went into the army as a private; at Arnold's attack on Quebec, acted as aid to gen. Montgomery, and endeavored to bring off the body of that officer, who fell at his side. He acted as brigade-major to Arnold, and in May, 1776, he became a member of Washington's military family, which he left after a few weeks to become aid to gen. Putnam. In 1777, he was made lieut.col., and won distinction at Monmouth in command of a brigade. In 1778–79, he was stationed near New York, and was for a short time in command of West Point. He was always opposed to Washington, whose military talents he esteemed very lightly. B. resigned in consequence of ill health in the spring of 1779, and three years later married Mrs. Prevost, the widow of a British officer, was admitted to the bar, and began the practice of law at Albany, N. Y. In 1784, and again in 1798–99, he was elected to the state assembly. In 1789, he was appointed attorney-general of the state, and in 1791 was chosen U. S. senator. He was an early, zealous, and unscrupulous partisan leader among the "republicans" (afterwards "democrats"), and the especial rival of Alexander Hamilton, the prominent leader of the federalists. In the presidential struggle of 1800, John Adams (then president), Thomas Jefferson, Charles C. Pinckney, and B. were the candidates, and the votes for Jefferson and B. were equal—73 for each. As the constitution then provided, the person having the greatest number of electoral votes was to be president, and the next highest was to be vice-president. This equal division devolved upon the house of representatives the settlement of the matter, and there each state had one vote only, a majority of all the states being necessary to elect. After a week of balloting, Jefferson was selected the president, B. being vice-president. He had been favored by Jefferson for that place from the first, but his ambition was higher, and he did his utmost to defeat Jefferson, who was the regular candidate of the party. This course politically ruined B.; he was thereafter trusted by no party, though in 1804 the federalists nominated him for governor of New York, the result being his defeat by Morgan Lewis. These disappointments and defeats, added to the intensely bitter character of the partisan warfare of the time, led to the duel (July 11, 1804) in which Hamilton was killed by Burr. For this act, which was then deemed little less than murder, B. was legally disfranchised in New York, and covered with the heavier curse of popular indignation. In the spring of 1805, he started for the western part of the country, bent, as was generally believed, upon establishing a government in the Mexican territories, and possibly comprising a portion of the Louisiana purchase. He bought a large tract of land on Red river, and intimated that the conquest of Mexican states was a part of the plan. It was in the course of these operations that he plundered the famous Blennerhassett (q.v.). President Jefferson caused him to be arrested (Feb. 19, 1807, in Alabama) on a charge of treason, for which he was tried the next month at Richmond, Va. The jury gave a verdict of acquittal, and the next year he visited Europe to raise the means for an attempt upon Mexico. Four years of effort amounted to nothing, and in 1812 he returned in extreme poverty, and began to practice law in New York; but his course had alienated the people, and he could never regain his position in the courts. At the age of 78 he married Madame Jumel, a widow, who had a large estate in the upper part of the city of New York; but they were soon afterward divorced, and B. died in 1836 on Staten island in poverty and utter abandonment, not only because of his political course, but more in consequence of his social character. He had but one legitimate child, a daughter named Theodosia, who became

the wife of Joseph Allston, governor of South Carolina. This daughter was probably the only human being except himself whom B. ever really loved; and she sailed from Charleston in the spring of 1812 on a visit to her father (who had just arrived from Europe), but the schooner on which she was a passenger was never afterwards heard of. There have been many stories told of its fate, and three or more dying prisoners have given relations of their part in the robbery and destruction of the vessel, but none have proved trustworthy. The most probable theory is that the schooner foundered off cape Hatteras in a furious storm that came soon after she sailed.

BURRANPOOTER. See BRAHMAPUTRA, *ante*.

BURRHUS, or BURRUS, AFRANIUS, d. 62 A.D.; a Roman prætor who promoted Nero's advancement to the throne. With Seneca's assistance, B. successfully resisted many of Nero's tyrannous acts; he opposed the murders planned by Agrippina, but would not become Nero's accomplice in her assassination or in that of Octavia. This is one story; but another is that he congratulated the royal monster upon the murder of his mother, and had his share of the spoils of Britannicus.

BURRIA'NA, a t. of Spain, in the province of Castellon-de-la-Plana, about 8 m. s. from the town of that name, is situated on the left bank of the Rio Seco, about 1 m. from its mouth in the Mediterranean. It has a pop. of 6200, who are chiefly engaged in agriculture and fishing; and exports wine, oil, and fruit.

BURRILL, JAMES, LL.D., 1772–1820; b. R. I.; graduated at Brown university, and in 1791 began practicing law. From 1797 to 1813, he was attorney-general of Rhode Island; in 1816, chief-justice; and in 1817, senator in congress, where he was an able opponent of the Missouri compromise.

BURRITT, ELIHU, a distinguished advocate of the doctrines of the peace society, and widely known as "the learned blacksmith," was born at New Britain in Conn., United States, in 1811. He was brought up to the trade of a blacksmith, but devoted all his leisure to study, especially to mathematics and languages. In the latter field of study, his range has been very wide, embracing more or less Latin, Greek, Hebrew, Arabic, and other oriental tongues, and almost all modern European and Slavonic languages. He is, however, much better known to the world as an earnest apostle of peace than as a scholar. To preach the doctrine of "universal brotherhood," he has traveled through Europe and the United States. His chief works are *Sparks from the Anvil*, *Olive Leaves*, *Peace Papers*, and *Lectures and Speeches*. He has taken a prominent part in the peace congresses of Brussels, Paris, Frankfort, London, and Edinburgh; and in advocating an ocean penny-postage. For many years he resided in England, part of the time as U. S. consul at Birmingham. He d. 7th Mar., 1879.

BURROUGHS, GEORGE, a graduate of Harvard, and preacher in Falmouth, Mass., in 1676, and in Salem in 1680. He was accused of witchcraft in having "tortured, afflicted, pined, consumed, wasted, and tormented" one Mary Wolcott. Though a man of the most unblemished character, he was condemned and hung at Salem, Aug. 19, 1692.

BURROUGHS, JOHN. See page 884.

BURROUGHS, STEPHEN, 1765–1860; a native of New Hampshire, who ran away from home when but 14 years of age and joined the army; deserted; became a student at Dartmouth college, where he committed various offenses and escaped; served for a time on a privateer; practiced medicine; taught school; officiated as pastor of a Congregational church until he was convicted of passing counterfeit money and imprisoned at Northampton. He set fire to the jail in hope of escaping, but did not succeed, and was sent to Castle island in Boston harbor, to a prison from which he escaped, with seven others, only to be recaptured. When finally released, he went to Canada, and was for years the chief of a band of counterfeiters, Late in life he was converted and became a member of the Roman Catholic church and a private teacher for the sons of wealthy citizens; and, it is said, "was esteemed and respected by all." His *Memoirs of My Own Life* was once as popular as the life of Jack Sheppard.

BURROWING OWL, or COQUIMBO OWL, *Athene cunicularia*, a species of owl that lives in the burrows of the prairie dog, or digs a home for itself; and seeks its prey (chiefly small insects) in daylight rather than like other owls in the night.

BURROWS, WILLIAM, 1785–1813; entered the U. S. navy in 1779, and served on the Barbary station. In the war with England he commanded the *Enterprise* in the engagement with the *Boxer* off Portland, Me., Sept. 5, 1813. The *Boxer* was taken; but B. was mortally wounded, living only long enough to receive the surrender. The English commander was also killed, and both officers were buried near each other at Portland.

BURRSTONE. See BUHRSTONE, *ante*.

BURSARY (Fr. *bourse*, Lat. *bursa*, a purse), the annual proceed of a sum permanently invested for the maintenance of a student at a university. A number of small bursaries were till lately the only equivalents at the Scotch universities for the scholarships of the English. Their large number and the small amount of each was, in course of time, found to have a prejudicial effect, more particularly at Aberdeen, which possessed the largest number, and where a practice had obtained of multiplying bursars on the

foundation, at the discretion of the senatus or patrons. Both the university commissioners of 1831 and those of 1863 expressed their opinion that it was less provision for encouraging learning in its earlier stages than adequate inducements to persons who have passed the preliminary class to make learning the business of their lives, that was wanted in Scotland. The general effect of the ordinances issued by the commissioners of 1863, in carrying out the directions of act 21 and 22 Vict. c. 83, was to consolidate some of the smallest bursaries into others of greater value, and in some instances to remove restrictions that had proved injurious, while a large number was thrown open to competition. There are, however, still a large proportion of purely presentation bursaries, and in some there is a preference given to a particular name, or to natives of a particular district. At Aberdeen, the commissioners founded eight scholarships of £65 annual value; at St. Andrews they so modified the Ramsay foundation as to found two scholarships of £60; and in Edinburgh they acquired funds sufficient to establish the Pitt and Mackenzie scholarships of £60 and £120 annual value. Since 1863, a large number of scholarships, tenable by graduates, and fellowships, have been founded by private individuals on a more liberal scale than the old bursaries, particularly in Edinburgh and Glasgow. At Edinburgh there are at present about 200 bursaries, of which above 100 are in arts, and 30 in theology; they vary in amount from £2 15*s.* 6*d.* to £100. Among the most considerable of them are two of £90, founded in 1809 by Dr. Donald Grant, for students of his own surname; one founded by sir John Macpherson in 1821, worth £88, for Highland students; the Jardine competition bursary of £40, four Lennie bursaries of £48, four Bruce bursaries of £30, and three of £40; two competition bursaries of £100 and £50 respectively, founded in 1860 by Mr. Patrick of Roughwood, for young men educated in Ayrshire; two bursaries founded in 1865 by Miss Scott of Horseliehill, and one by Miss Harrison in 1867, for £40 each; and two founded by the Rev. John Spence in 1867, for £50. The scholarships for graduates are about 30, varying in amount from £60 to £120; and there are about eight fellowships varying from £100 to £160. Of 190 bursaries at Glasgow, many of them small, the most considerable are six founded by lord Dundonald in 1672, four in philosophy and two in divinity, of £40; two by Mr. Patrick, of £100 and £50 respectively; and the Brisbane medical bursary of £50, founded in 1877. Glasgow has also 14 exhibitions to Balliol college, Oxford, on the Snell foundation (q.v.), and about 30 scholarships of from £50 to £200, the highest being the four founded by George A. Clark, in 1872. At St. Andrews there are 81 bursaries belonging to the United college, varying in amount from £5 to £50; 20 belonging to St. Mary's, varying from £6 to £50; and 20 of the same value transferable from the United college, when the bursars proceed to the study of divinity; two Ramsay scholarships of £50; one Guthrie scholarship worth £100 the first year, and afterwards £50; one Patrick Kidd scholarship, worth about £40; and two scholarships of £50, founded by Mrs Tyndal Bruce. At Aberdeen there are about 250 bursaries, varying from £5 to £50; and 11 scholarships of £65 to £70, tenable for 4 years, also some valuable exhibitions to Cambridge.

BURSCHENSCHAFT, an association organized by German students for the purpose, originally, of reforming the excesses and outrages customary at the universities of Germany, and to arouse a spirit of nationality by uniting the students of different universities. The first organization of the B. took place at Jena in 1815, and most of the students who became members had fought in the German war of independence; during 1815–17 it spread to Tübingen, Heidelberg, Halle, and Giessen. As it was evident that the students were to be disappointed in the hope that the war would be followed by political reforms, the B. of Jena decided to have a general gathering of the associations, which took place at the Wartburg, Oct., 1817. At this festival all the universities were represented, and in Oct. of the following year, delegates from 14 universities adopted a constitution, which was agreed to by all except the universities of Austria, Göttingen, and Landshut; they adopted the colors of the German empire, black, red, and gold, and resolved to hold annual conventions. In 1819, Kotzebue, the German dramatist, who had been declared by the B. a traitor to his country, was assassinated by Sand. After a conference at Carlsbad, the German government took steps to suppress the B., but without avail; it resulted only in their holding secret instead of public meetings. The original plan of a national B. was revived in 1827; the chief obstacle was the difference of view held by the Germanen, who desired to bring about the unity of Germany by practical and political means, and the Arminen, who laid more stress on the ideal unity of their country and the cultivation of individual powers. The views of these two parties were discussed at the convention of Bamberg in 1827, and in Frankfort in 1831; and, although the Arminen had the larger number of followers, they were obliged to give way to the more energetic Germanen. On the 25th of Dec., 1832, the B. resolved to attain the freedom and unity of Germany by a revolution; all the students were called upon to support the B., whose headquarters were at Frankfort-on-the-Main. The attempt was made at Frankfort in June, 1833, in which nearly 2000 students were implicated. It resulted in the arrest and prosecution of students at all the German universities, and many of them were imprisoned and disfranchised. The students of Vienna, who had never before been connected with the B., took a prominent part in the revolution of 1848.

BURSLEM, a t. of Staffordshire, on the Trent and Mersey cana., in the pottery district, is a station on a branch of the North Staffordshire railway. It forms part of the parliamentary borough of Stoke-upon-Trent. Pop. '81, 27,108. The abundance of coal and the variety of clays have made B., since the 17th c., one of the chief seats of the fictile manufacture. Porcelain and pottery of all kinds—Parian, iron and stone ware, etc.—are produced on a large scalc, as well as encaustic tiles. There is also a glass manufactory here. The affairs of thc town are managed by a "local board of health." At Birche's Head, a mile and a half from B., stands a large service rcservoir of the Staffordshire waterworks company, from which the town and neighborhood are supplied with excellent water. A finc new town-hall was erected in 1865, which, besidcs the usual municipal offices, contains lecturc rooms and news rooms. B. was the nativc place of Josiah Wedgwood, who in the middle of the 18th c. greatly improved the manufacture of pottery. A Wedgwood memorial institute has recently been erected, to serve as a school of art, a frec library, and a museum. An appropriate character is given to it by introducing into the ornamentation of the façade terra cotta moldings, Wedgwood's jasper ware, ctc.

BURT, a co. in e. Nebraska, on the Missouri river; 500 sq.m.; pop. '76, 4354; in '80, 6937. The Omaha and Northwestern railroad passes through it. Agriculture is the chief business. Co. seat, Tekama.

BURTON, Asa, D.D., 1752–1836; a graduatc of Yale in 1777; in 1779 settled as pastor of a Congregational church in Thetford, Vt., where he remained all his life. He published many sermons, and *Essays on Some of the First Principles of Metaphysics, Ethics, and Theology.*

BURTON, John Hill, advocate (member of the Scottish bar), has achieved for himself a place in the world of letters by a variety of works, all remarkable for ability, and several for original thought. B. was born at Aberdeen on the 22d of Aug., 1809; his father was an officer in thc army, and his mother the daughter of an Aberdeenshire laird. Having graduated at Marischal college, Aberdeen, he became an apprentice to the profession of law in his native city; which, however, he afterwards abandoned for the higher sphere of thc Edinburgh bar. Here, with time on his hands, he devoted himself to study and letters. For a long series of years, from 1833 downwards, he was a contributor to the *Westminster Review* of articles on law, history, and political economy; and for several years he contributed to *Blackwood's Magazine* literary sketches. Among his original works may be mentioned, *The Life and Correspondence of David Hume,* 2 vols. (1846); *Lives of Simon Lord Lovat and Duncan Forbes of Culloden* (1847), both excellent biographies; *Political and Social Economy* (1849), which is a valuable, condensed, and lucid contribution to the literature of social science; *Narratives from Criminal Trials in Scotland; A Manual of Scottish Law; A Treatise on the Law* (Scottish) *of Bankruptcy; The History of Scotland from the Revolution to the Extinction of the Last Jacobite Insurrection,* 2 vols. (1853); *The History of Scotland from Agricola's Invasion to the Revolution of* 1688, 7 vols. (1867–70); *The Book-Hunter* (1862); *The Scot Abroad,* 2 vols. (1864); *The Cairngorum Mountains* (1864). A new edition of the *History of Scotland,* enlarged and partly rewritten, appeared in 8 vols., 1873. He has edited vols. i. and ii. of the *Register of Privy Council* (Scotland) for 1545–78; and is about to bring out a history of the reign of queen Anne. The high merits of B.'s historical works have been universally admitted. He has further edited the works of Jeremy Bentham (nominally in conjunction with the late sir John Bowring), with an able introduction; and has published a volume of *Benthamiana.* B. was, in 1854, appointed secretary to thc prison board of Scotland; and on the abolition of that board in 1860, he remained as stipendiary manager and secretary in connection with the Home office. On the passing of the prisons (Scotland) act, 1877, B. was appoined one of the prison commissioners for Scotland. He holds the old office of historiographer royal for Scotland, is LL.D. of Edinburgh university, and D.C.L. of Oxford. He d. Aug. 9, 1881.

BURTON, Richard Francis, one of the most daring and successful of modern travelers, was b. in 1821 in Norfolk. He is the son of col. J. N. Burton, and was educated in France and England. In 1842, he entered the Indian army, and served many years in Sindh. While in this employment, he exhibited a remarkable facility in acquiring the eastern languages, and a still morc remarkable dexterity in imatating the appearance and habits of the natives of India. In 1851, hc published his first important work—*Sindh, and the Races that inhabit the Valley of the Indus*—full of graphic description, and interesting to all readers. B. had acquired a very familiar acquaintance with Hindustani, Persian, and Moultani. He had devoted special attention to Arabic, and had made such progress as to be able to speak it likc a native. Possessed of these qualifications, he resolved to explore Arabia in the disguise of an Afghan pilgrim; and after a visit to England, he set out on his journey. Political commotions prevented him from traversing the whole country, as he intended; but his *Personal Narrative of a Pilgrimage to El Medinah and Meccah* (1855) records one of thc most daring feats on record. A perpetual strain on the ingenuity was necessary to keep up his assumed character, most difficult in moments of fatigue, and in the midst of shrewd and observant fellow-travelers. Thc next journey undertaken by B. was into the country of the Somaulis, in eastern Africa. It provcd less successful than was anticipated. B.'s com-

panion, lieut. Stroyan, was killed, and B. himself was wounded. He succeeded, however, in reaching Harar (q.v.), a most important town in eastern Africa, not before visited by any European, and in penetrating a vast and populous region scarcely known to geographers. The journey led to a still more important series of expeditions—those to the country of the upper Nile. Towards the end of 1856, B. set out in company with lieut. Speke, also of the Indian army, to ascertain the truth of the reports collected by the missionaries, that a vast sea existed in the heart of the continent. The journey is one of the most memorable of our time. It led to the discovery and exploration of the great lake of Tanganyika, and the opening up of the eastern part of the continent. B. was rewarded with the medal of the geographical society. His health had been affected by his African journeys, and he sought to recover it by a journey in North America, from which he brought the first reliable account of the Mormons. In 1861, B. was appointed consul at Fernando Po, on the w. coast of Africa, and while holding this appointment, he visited the Cameroon mountains, and went on a mission to the king of Dahomey, the incidents of both journeys being recorded in two of his most interesting works. B. has subsequently been consul at Santos in Brazil, and at Damascus; and on the death of Mr. Charles Lever in 1872, B. succeeded him in the post of British consul at Trieste. B. visited the Guinea coast, '82, with Capt. Cameron.

The following is a list of the principal works of capt. B. not mentioned above: *Sindh, or the Unhappy Valley* (1851); *Goa and the Bue Mountains, or Six Months of Sick Leave* (1851); *Falconry in the Valley of the Indus* (1852); *First Footsteps in East Africa, or an Exploration of Harar* (1856); *The Lake Regions of Central Africa, or a Picture of Exploration* (1860); *The City of the Saints, and Across the Rocky Mountains to California* (1861); *Abeokuta, or the Cameroon Mountains* (1863); *The Nile Basin; A Mission to Gelele, King of Dahomey, with Notices of the so-called Amazons*, etc.; *Explorations in the Highlands of Brazil; Vikram and the Vampire; Zanzibar; Two Trips to Gorilla Land; Ultima Thule, or a Summer in Iceland; Etruscan Bologna* (1876); *Sindh Revisited* (1877); *The Gold Mines of Midian and the Ruined Midianite Cities* (1878), giving an account of B.'s investigations in that region during journeys in 1876 and 1877; *To the Gold Coast for Gold*, 1882.

BURTON, Robert, author of the *Anatomy of Melancholy*, was b. at Lindley, in Leicestershire, in 1576, and studied at Brasenose and Christ church, Oxford. In 1616, he was appointed to the vicarage of St. Thomas, and in 1628, to the rectory of Segrave in his native county. He appears, however, to have continued all his life at Chirst church, where he died in 1640, leaving legacies of £100 each to the Bodleian and Christ church libraries, and as many of his books as they did not already possess. A monument was erected to his memory in Christ church cathedral. B. is described by Anthony Wood as a good mathematician, a dabbler in nativities, a well-read scholar, and a thorough-paced philologist. "As he was by many accounted a severe student, and a melancholy and humorous person, so by others who knew him well, a person of great honesty, plain-dealing, and charity. I have heard some of the ancients of Christ church often say that his company was very merry, facete, and juvenile." His *Anatomy of Melancholy*, in which he appears under the title of Democritus Junior, is one of the most curious *melanges* of heterogeneous elements ever put together. It consists mainly of an extraordinary mass of quotations from old and obscure writers, stung on a thread of rambling reflection; often tiresomely pedantic, but relieved by quaint touches of humor and feeling. In his own life-time, it was highly popular, and went through five editions; after that, it fell into comparative oblivion, but is now again popular among lovers of quaint literature. Dr. Johnson said it was the only book that ever took him out of bed two hours before his usual time.

BURTON, William Evans, 1804–60; b. London; son of William George B., author of *Biblical Researches*. He was intended for the church, and received a classical education; at 18 took charge of his father's printing establishment and edited a magazine. From amateur acting he drifted towards the regular stage, and made a successful début at the Haymarket, in 1832. He began also to write dramas, one of which was played simultaneously at five London theaters. In 1834, he came to the United States, where he was always prominent as actor or manager, chiefly in Baltimore, Philadelphia, and New York. In Philadelphia he established the *Gentleman's Magazine*, a literary monthly. His greatest success was in the management of the Chambers street theater, New York, where, with Brougham and others, he produced dramas from several of Dickens's novels. His own forte was low comedy, and some of his characters were so established in public favor that no actor has satisfied an audience in them since his death. Such were "Captain Cuttle," "Toodles," "Micawber," "Aminadab Sleek," "Paul Pry," and others. He was a fine scholar, and had a superior library, particularly of Shakespearian literature. He was for several years the editor of the *Literary Souvenir*, and published in two vols. a *Cyclopædia of Wit and Humor*.

BURTON-ON-TRENT, a market t. in Staffordshire, on the river Trent and the Midland railway. The Grand Trunk canal also passes the town, and enters the Trent below. A bridge of 34 arches, built before the Norman conquest, here crossed the river, but was replaced in 1864 by a new one of 29 arches. The population of B. has been nearly trebled within the last 20 years, being, in 1881, 39,285. This is owing to the rapid extension of the brewing of ale, which is the staple product of the place. There

are upwards of 30 breweries in B., some of them on a scale of unparalleled magnitude. The two establishments of Bass and Allsopp cover together more than 250 acres of ground, and can produce yearly about two million barrels of ale. There are, of course, extensive cooperages, and also iron-foundries. The public edifices are not particularly noticeable.

BURTSCHEID, or BORCETTE, a t. of Rhenish Prussia, about half a mile distant from Aix-la-Chapelle, with which it is connected by an avenue of trees. It has manufactures of woolen cloths and cassimeres, and celebrated sulphur springs and baths, with a temperature of 106° to 155° F. Pop. '80, 10,989.

BUR'WHA, or, as Dr. Barth spells it, BARUWA, a t. of Bornu, central Africa, situated on the w. bank of lake Tchad, about 80 m. n.n.w. of Kuka. The town, which consists of closely packed huts, is surrounded by high clay walls, which, however, "owing to the high mounds of rubbish imbedding them on all sides," afford no protection whatever from the attacks of the Tawarek, to whom the inhabitants have to pay tribute. Fish in great quantities are caught in the adjoining lake, and form the chief food of the inhabitants, as well as their only article of commerce. Pop. about 6000.

BURY, a flourishing manufacturing t. in the s.e. of Lancashire, on a rising ground backed by hills on the n. and e., between the Irwell and the Roche, 9 m. n.w. of Manchester. It was early a seat of the woolen manufactures, carried on by Flemings, but these, though still considerable, now yield in importance to those of cotton. Besides spinning and weaving factories, there are important print, bleach, paper, and dye works, and some large foundries and engine manufactories. In the vicinity are excellent freestone quarries, and abundant coal-mines. The town has recently been much improved in drainage, and an ample supply of water has been secured from hills at a distance. Pop. '81, 49,746. B. returns one member to parliament. Some improvements in the cotton manufacture arose here—notably, the invention by John Kay of the fly-shuttle. The late sir Robert Peel was born in B., where his father established his great print-works. A bronze statue of sir Robert has been erected in the old market-place.

BURYING BEETLE, *Necrophorus*, a genus of coleopterous (q.v.) insects, of the tribe or family *silphales*, with short cub-shaped antennæ, remarkable for their habit of burying the bodies of mice, moles, and other small animals, in order to deposit their eggs in them, and to provide a supply of food for their larvæ. Some of the species are natives of Britain, among which is *N. vespillo*, the species of which the habits were first observed, which is, however, more common in some parts of continental Europe. It is a black beetle, about an inch long, with two bright orange bands across its back, and having an excessively fetid smell, which long adheres to whatever it touches. Its sense of smell would seem to be extremely acute, and a dead animal soon attracts it, a pair generally arriving together, male and female, to feed upon the body, and the male to proceed to its interment, if sufficiently small, previous to which, however, they have sometimes to drag it to some distance to a ptace suitable for their purpose. The head of the insect is the only tool employed in the operation, and is held sloping outwards, and employed in a manner which exhibits great muscular power. A furrow is first made around the body, then another within the first, and so on till the earth is so excavated from beneath, that the body begins to sink, when the insects, by great efforts, drag it down into the hole, and when it is fairly in, the excavated earth is thrown back over it. The female then lays her eggs in it; and when this is accomplished, and the cravings of appetite are satisfied, it is left for the larvæ, which are of a lengthened form, with six feet, whitish, and a brown head.—The known species of B. B. are mostly native of Europe and of North America.

BURY ST. EDMUNDS, or ST. EDMUNDSBURY, an ancient borough in Suffolkshire, on the Upper Larke, 26 m. n.w. of Ipswich. It is well built, and delightfully situated. Pop. '81, 16,211. It returns two members to parliament. It has a trade in wool, butter, corn, and cheese, but no manufactures. A very complete system of drainage has been carried out, the sewage being conveyed to a distance, and, by means of pumps, applied to irrigation. A new corn exchange was erected in 1862; in 1864, the Suffolk general hospital was rebuilt. B. received its name from Edmund, the Saxon king and martyr, who was crowned here on Christmas day, 856; taken prisoner, and put to death by the Danes. On the site of his tomb, six priests founded a monastery: and here Canute raised a Benedictine abbey, which in time became the richest and most important in England, save that of Glastonbury. From 1020 to its dissolution by Henry VIII., it was ruled over by a line of 33 abbots. The abbot was a spiritual baron of parliament, had judicial authority in all causes within the liberty of B., had the power of inflicting capital punishment, and the privilege of coining. At the dissolution, the annual income was equivalent to £50,000 of our money. Of this magnificent establishment, little now remains but the western gate, erected in 1327, a noble relic of the decorated Gothic style; and the "church-gate," a quadrangular tower of massive simplicity, 86 ft. high. The churchyard, to which this tower formed the portal, includes, besides the abbey ruins and some other buildings, the fine old churches of St. Mary and St. James. The celebrated grammar-school of B. was founded by king Edward VI. in 1550, and is free to sons of the inhabitants of the town. It has 2 scholarships at Cambridge, and 6

exhibitions to each university, and has produced many eminent scholars. Among the many religious and charitable institutions connected with the abbey, of which portions still exist, is St. Saviour's hospital, founded by that notable abbot, Samson, whose life and actions, as recorded by Jocelyn of Brakelond, Mr. Carlyle has so vividly recalled in his *Past and Present.* The poet Lydgate was a monk in this abbey; and sir Nicholas Bacon was born here. At B., king John first met his indomitable barons before he signed Magna Charta. Parliaments were held here in 1272, 1296, and 1446, the last of which ordered the arrest of Humphrey, the good duke of Gloucester, who was found dead in his bed the morning after his arrest; and sovereigns, as late as Elizabeth's time, were often nobly entertained at St. Edmund's town. Three m. s.w. of B., the Marquis of Bristol has a splendid seat, Ickworth park, a circular pile 90 ft. in diameter, and 140 ft. high.

BUSACHI'NO, or BISAQUI'NO, a t. of Sicily, in the province of Palermo, about 29 m. s.s.w. of the city of that name. It has manufactures of linen, and a population of 9100.

BUSA'CO, a ridge or serra on the n. side of the river Mondego, in the province of Beira, Portugal, about 20 m. n.n.e. of Coimbra. Here Wellington, with about 40,000 British and Portuguese troops, repulsed the attack of Massena with 65,000 French, 26th Sept., 1810. Unable to force the position, Massena turned it by a pass over an adjoining ridge, and Wellington retired behind the lines of Torres Vedras, which indeed it was his intention to do, even if there had been no battle.

BUSBECQ, AUGIER GHISLEN DE, a Flemish diplomat, 1532–92. He was engaged in many important negotiations, and twice sent by the emperor Ferdinand I. to the court of Constantinople. In 1562, he was made tutor to Maximilian II. in Vienna. He wrote *Discourse of the State of the Ottoman Empire,* and a *Relation of My Two Journeys to Turkey.*

BUSBY, RICHARD, the most famous of English schoolmasters, was b. at Lutton, Northamptonshire, Sept. 22, 1606. Educated at Westminster school, and Oxford, he was, in 1640, appointed headmaster of Westminster school, the duties of which office he continued to discharge until his death in 1695. He is the type of pedagogues alike for learning, assiduity, and the application of the birch. He was a most successful teacher, and at one time could point to no less than sixteen occupants of the bench of bishops who had been educated in his school; and altogether, he has the reputation of having "bred up the greatest number of learned scholars that ever adorned any age or nation." He published several works, but they were chiefly for school use.

BUS'CA, a t. of Piedmont, situated on the left bank of the river Maira, an affluent of the Po, about 9 m. n.w. of Coni. Excellent wine is produced in the vicinity. Pop. 9375.

BUSCH, JOHANN GEORG, 1728–1800; a German philanthropist and statistician, professor of mathematics in the Hamburg gymnasium. He established an association for the promotion of art and industry, and a school of trade, the latter becoming especially famous. He wrote largely upon the history and theory of trade and commerce, and on questions of political economy.

BUSCH, JULIUS HERMANN MORITZ. See page 884.

BÜSCHING, ANT. FRIEDR., a celebrated geographer, was b. 27th Sept., 1724, at Stadthagen, in the principality of Schaumburg-Lippe, Germany. He studied theology at Halle, where he enjoyed the friendship of Baumgarten. In 1754, he was appointed extraordinary professor of philosophy in Göttingen, but soon incurred the displeasure of the Hanoverian government by his religious heterodoxy. Göttingen thus becoming an unpleasant residence to him, he accepted an invitation, in 1761, to St. Petersburg as preacher to a Protestant congregation there. In 1765 he returned to Germany, and in 1766 was called to Berlin as upper consistorial councilor and director of a *gymnasium* in Berlin, where he died, 28th May, 1793. Until the appearance of B.'s *Erdbeschreibung,* the first volume of which was published at Hamburg in 1754, neither Germany nor any other nation possessed a geographical work which made any pretension to scientific treatment or completeness of execution. The changes in the political arrangements of the world have, however, deprived the work of its original value, but it has been corrected and edited by subsequent writers. Of his other numerous publications, the most important is the *Magazin für Historie und Geographie* (25 vols. Hamburg, 1767–93).

BUSEMBAUM, HERMANN, a theologian of the order of Jesuits, was b. in 1600 at Nottelen in Westphalia. About 1640, he taught ethical philosophy at Cologne, and later was appointed rector of the college of Jesuits at Münster. He died 31st Jan., 1668. His work entitled *Medulla Theologiæ Moralis* (1645), was celebrated as a standard authority in the seminaries of the Jesuits, though several of its propositions were condemned by the pope. It has gone through more than fifty editions. It was enlarged by the Jesuit Lacroix (1707), and re-edited, with improvements and additions, by the Jesuit Montausan in 1729, and again by Alfonso de Ligorio in 1757. As it was found that the work contained doctrine in favor of regicide, it was burned, by order of the parliament of Toulouse, on the occasion of an attempt made on the life of Louis XV. by Damiens in 1757. Subsequently, the Jesuits Zachariah and Franzoja of Padua wrote in defense of B.'s work.

BUSENTO, a river of Salerno, Italy, emptying into the bay of Busento. This is the stream that was turned from its channel by the followers of Alaric, who buried that great leader in the original bed of the stream and then restored the water to its natural course so that no enemy could find the grave.

BUSH, GEORGE, D.D., 1796–1859; b. Vt.; a graduate of Dartmouth college and Princeton seminary; ordained in the Presbyterian church, and four years a missionary in Indiana. In 1831, he was appointed professor of Hebrew and oriental literature in New York university. In 1832, he published a *Life of Mohammed*, and the next year a work on the millennium, in which he held that the beginning of the millennial age was marked by the triumph of Christianity over Roman paganism. He also wrote a Hebrew grammar, and seven volumes of commentary on the Old Testament. In 1844, he conducted *The Hierophant*, devoted to the explanation of prophetic symbols, and published a work in which he opposed the idea of a physical resurrection of the body. In 1845, he united with the New Jerusalem church, and began to translate Swedenborg's works. In support of these doctrines, he edited the *New Church Repository*. His latest work was *Priesthood and Clergy unknown to Christianity*.

BUSH ANTELOPE, BUSH BUCK, and BUSH GOAT, names common to a number of species of antelope (q.v.), natives chiefly of the southern and western parts of Africa, forming a section of the genus *antilope*, which some naturalists have attempted to erect into a distinct genus (*vhilatomba* or *cephalopus*). They are animals of more compact form, shorter limbs, and greater strength, but much less agility, than the true or typical antelopes. They are remarkable for the arched form of the back. They have short, straight, or slightly curved horns, situated far back, and generally peculiar to the male sex, with usually a long tuft of hair between them. They have no tear-pits, but instead of them, a naked glandular line, formed of two series of pores, on each cheek. They frequent jungles, thick forests, and beds of reeds, and when pursued, seek to escape by diving into a thicket. The common or white-backed B. A. of Sierra Leone (*antilope sylvicultrix*) is about 3 ft. high at the shoulder; it is a dull, heavy, awkward-looking animal; keeps concealed in the thickets during the day, living singly or in pairs, and feeds in the open spaces in the early mornings only. To shoot it, sportsmen place themselves on the margin of the woods, and watch their opportunity as it comes out to graze. Its flesh is more esteemed than that of the more agile antelopes. Nearly 20 other species are usually ranked in this section of antelopes, among which is the *kleene boc* (*antilope pygmæa*) of s. Africa, a species abundant in many parts of Cape Colony, of very small size, not more than one foot in height at the shoulder, and with horns only about 1½ in. in length. It is a timid, gentle animal, easily domesticated. It differs from the typical bush antelopes in the great activity which it displays.

BUSHEAB', a low, flat island in the Persian gulf, about 11 m. from the Persian coast, in lat. 26° 50′ n., long. 53° 12′ east. It is about 18 m. long, narrow, and well-peopled, with a town and harbor at its western extremity. Its proper name is *Khoshaub*, signifying "good water."

BUSHEL [Fr. *boisseau*, allied to *boi(s)te*, box, butt; Lat. *butta*, a measure in general], a dry measure used in Britain for grain, fruit, etc. The quarter contains 8 bushs., and the bushel 8 gals., the gallon measuring 277.274 cub. in., and holding 10 lbs. avoirdupois of distilled water. Hence the imperial bushel contains 80 lbs. of water, and measures 2218.2 cub. inches. The old Winchester bushel measured 2150 cub. in.; hence 33 Winchester bushs. = 32 imperial bushs. nearly.

BUSHIRE. See ABUSHEHR.

BUSHMAN'S RIVER, or BOS'JESMAN'S RIVER, in the e. part of the Cape Colony, s. Africa, is about 200 m. long, and forms on its lower course the w. boundary of Albany, whose capital is Graham's Town. Its general direction is from n. to s., its mouth being about 33½° s., and about long. 26½° east.

BUSHMEN, or BOSJESMANS; so named by the Dutch colonists, but calling themselves SAAB, or SAAN; an aboriginal race of s. Africa, somewhat like, and yet differing from, the Hottentot, but like them having nothing in common with the Kaffer or negro. They rank with the savage of Australia among the lowest existing types of mankind, and are in a most degraded and destitute condition. They are of small stature, of dirty yellow color, and very repulsive features. The cheek-bones are large and prominent, the eyes deep set and crafty in expression, nose small and depressed, and the hair in small woolly tufts with bald spaces between. Of 150 measured by a traveler, the tallest man was 4 ft. 9 in., and woman 4 ft. 4 in. Some are well proportioned, active, and capable of enduring great privations and fatigue. Those furthest n., near lake Ngami, are considerably larger in body. They clothe in skins and are fond of ornaments, decorating their arms and legs with beads and rings, and the women sometimes paint their faces red. They dwell in huts of reed or in holes in the ground; in the mountain districts they live among the rocks with mats for shelter. They have no cattle, nor any animals except a few half-wild dogs, nor have they the least signs of agriculture; but as they live by hunting they are well acquainted with the habits of animals, and follow the herds of antelope in their migrations. Their weapons are bows and arrows, the latter tipped with bone or iron, and poisoned with vegetable matter

mixed with the venom of snakes or spiders, or the entrails of an extremely poisonous caterpillar are used alone. On account of the use of these fatal poisons the B. are held in dread by neighboring tribes. The discovery of their rude tools for digging tubers, scattered over wide regions not now occupied by them, indicates the existence of greater numbers of B. in earlier times. They have no approach to tribal organization, nor any chiefs; bodily strength forming the only distinction of superiority. Their various dialects are not understood by the Hottentots, the tongue of the latter being more agglutinative, that of the B. more monosyllabic; the Hottentots use gender in names, while the B. do not. The Hottentots can count 20; the B. only 2—calling all above that "many." The B. possess a pictorial faculty not known in any other south African tribe, and the rocks of the Cape Colony and Drakenberg mountains show many examples of Bushman drawings of men, women, children, and animals. Rings, crosses, and other signs, drawn in blue on rocks and stones, and believed to be centuries old, have given rise to the suggestion that these may be the remains of hieroglyphic writing; and the discovery of drawings of men and women with antelope heads, also very ancient, recalls the mythological figures of Egypt. The B. have a kind of intelligence, and are valued as servants by the Boers, being much more energetic than the Hottentots. A wholesale destruction of B. on the borders of the colony in earlier years, reduced their numbers greatly; and though this hunting of them has ceased, their children are still captured by the Boers for servants. The B. retaliate by ravaging the farms on the border and driving off cattle. As they once occupied a much larger area, it seems probable that the B. are the remains of the earliest aborigines of s. Africa, and that they existed there before the Kaffers, and perhaps before the Hottentots. A former and more general distribution of the race is indicated by the discovery in late years of undersized people near the upper Nile basin and on the western equatorial coast land by Dr. Schweinfurth and Du Chaillu.

BUSHNELL, Horace, D.D., 1802–76; b. Conn., graduated at Yale in 1827, where he studied law and theology; in 1833, became pastor of the North Congregational church in Hartford. He was a voluminous writer on theological subjects; some of his works being *Principles of National Greatness; Christian Nurture; God in Christ; Christian Theology; Sermons for the New Life; Nature and the Supernatural; Work and Play; Christ and His Salvation; Woman's Suffrage, the Reform Against Nature; The Vicarious Sacrifice.* He was also a writer for various periodicals and newspapers. He was a bold and original thinker, with peculiar eloquence of style. Though strongly evangelical in belief, he denied the Calvinistic theory of the atonement (known as the "satisfaction theory"), and gave less than the ordinary emphasis to the distinction between the persons in the Trinity. These, with other divergences, led to his being accused of heresy; but ultimately the fellowship of the Congregational churches was found broad enough to include him, and he kept his standing therein with growing influence until his death. During his later years his health compelled his relinquishment of the active pastorate, but his labors in authorship were unintermitted. While his theory of the atonement has not commended itself in its exact form to the majority of evangelical Christians, and is adhered to by no organized sect or party, it cannot be denied that his moral earnestness, his spiritual power, his wondrous suggestiveness, his brilliancy of thought and style, and his broad mental scope, have profoundly modified the thinking of the present age through almost the whole circle of Protestant denominations. Indeed, with his detestation of all provincialism and sectarianism, he would have chosen any other form of influence rather than that which is exercised by the leader of a party in the church.

BUSHWHACKERS, a term much in use in the war of the rebellion (though well known before) to indicate men who pretended peace or neutrality, but who were ready to make secret attacks whenever opportunity offered. They were numerous in some western states, where many of them were summarily shot as outlaws.

BUSI'RIS, an Egyptian t., capital of the B. nomos, in the hieroglyphic language, the "Place of Osiris," believed to correspond to the modern Abusir, and situated about the middle of the delta. It was supposed to be near the entrance of the gates of Elysium. Close to B. was the pyramid of king Sahura, of the 4th dynasty, known as the Sa-ba, or "pyramid of the rising soul." The shrine of the goddess Isis was in B. and a great annual festival and lamentation for Osiris was held there. The place was destroyed by Diocletian, but the Copts and Arabs have preserved the name in Bousiri and Abusir.

BUSI'RIS, a mythical king of Egypt mentioned by the later Greek writers. After Egypt had been afflicted for nine years with famine, Phrasius, a seer from Cyprus, announced that the famine would not cease until a foreigner was annually sacrificed to Zeus. B. began by sacrificing Phrasius, and continued the custom yearly; but when he undertook to make a victim of Hercules the latter burst his bonds and with his club slew B. and his son Amphidamas. Attempts to find the place of B. as an actual king have not succeeded. There is no good reason to believe that human sacrifices were ever offered in Egypt.

BUSKIN, a kind of half-boot, lacing tight to the leg. The ancient tragedians wore buskins (*cothurni*), often with thick soles, to add to their stature. Hence the B. is often put for tragedy, as the sock (*soccus*, a flat soled shoe) for comedy. In ancient sculpture,

Diana, and hunters in general, as well as men of rank and authority, are represented in buskins often highly ornamented.

BUSS is the name of a small vessel, usually from 50 to 60 tons' burden, much used in the herring fishery, especially by the Dutch. The B. has two small cabins—the one at the prow serving as a kitchen. The remaining space is a receptacle for fish.

BUSS, Frances Mary. See page 884.

BUSS, Franz Joseph von. See page 885.

BUSSAHIR', a hill-state of Northern India, on the border of Chinese Tartary, in n. lat. 30° 56′ to 32° 8′, and e. long. 77° 34′ to 78° 52′. It is one of the most elevated and mountainous countries in the world, the lowest part being more than 3000 ft. above the sea, and much of it from 7000 to 12,000 feet. The Sutlej flows through the country from e. to west. The district on the n. of the Sutlej is called Kunawur, that on the s. is B. proper. The climate in the lower parts on the southern frontier is almost tropical, and there are many genial and fertile districts of mild temperate climate; other districts are near, and within the limits of perpetual snow. The vine succeeds admirably in many places, and it is supposed that some parts of this state are extremely suitable for the culture of tea, which, indeed, is cultivated to some extent. Very rich deposits of copper ore have been discovered in Kunawur, and copper-mining is prosecuted near the s.w. frontier. The inhabitants are little advanced in civilization; many of those in the more northern parts have strongly marked Mongolian features. Polyandry prevails among them, and the females left unmarried take refuge in Lamaic convents. The rajah and upper classes in the southern parts are Rajpoots, and the people generally are of Hindu race. Their observance of Hinduism, however, is very partial. The rajah of B. holds his dignity by a grant from the East India company, made on the expulsion of the Ghoorkas in 1815. The tribute paid is £340. The pop. is estimated at 90,000. Principal productions are opium, grain, and woolen manufactures.

BUSSEY, Benjamin, 1757–1842; served as a private soldier in the revolutionary army; after the war, began business in Boston and accumulated a fortune, most of which, after the death of certain relatives, went to the support of the law and divinity schools in Harvard college, and the founding of a school of agriculture, for which special object he gave a large farm near Boston.

BUSSON, Charles. See page 885.

BUSSORA. See Bassora, *ante*.

BUSSU PALM, *Manicaria saccifera*, a South American palm, growing in the tidal swamps of the Amazon, the only known species of its genus. The stem is only 10 to 15 ft. high, curved or crooked, and deeply ringed. The leaves are simple or undivided, and are the largest of the kind produced by any known palm, being often 30 ft. long, and 4 or 5 ft. wide. They are simply branched, drooping, and the fruit is of an olive color, large, hard, and three-seeded. The leaves make excellent and durable thatch, being split down the midrib, and laid obliquely on the rafters, so that the furrows formed by the veins lie in a nearly vertical direction, and serve as so many little gutters to carry off the water. The spathe, taken off entire, is used by the Indians as a bag, or the larger ones are stretched out to make caps.

BUST (Ital. *busto;* Fr. *buste*), in plastic art, the name given to a sculptural representation of the head and upper part of the human body. The earliest busts formed by the ancients were probably those heads of Mercury which, when elevated on tall square blocks of stone, received the name of hermæ (q.v.). These hermæ were afterwards frequently surmounted by representations of other divinities, such as Minerva; and as they gradually assumed more and more of the human form, they passed into busts, which were made of marble, bronze, etc. But it was not till very late in the history of art that busts, in the sense of portraits of individuals, came to be used, either in Greece or Rome; and it is remarkable that neither Greeks nor Romans designated them by any special name, for the Latin word *bustum* had a quite different meaning. It was not till Alexander's time that busts were used for purposes of portraiture in Greece; and most of the Roman busts which we possess belong to the period of the emperors. During the learned period of Greece, which commenced with Aristotle, portraits of men of letters formed an important department of art; and it became an object with the founders of museums and libraries to procure complete sets of them. The artists of this period exhibited remarkable ability in expressing the characters of the individuals whom they represented. In this way we have well-authenticated busts of Socrates, Plato, Zeno the Stoic, and other philosophers; of poets and orators, such as Isocrates and Demosthenes; of Athenian statesmen and distinguished women. In Rome, representations of the kings, and persons of distinction belonging to the earlier period, were probably made from the *imagines majorum* which every patrician preserved in his atrium, and which were commonly made of wax. These, no doubt, were often merely fanciful representations, partly taken, it may be, from the more prominent features which belonged to the existing members of the family. The earliest well-authenticated Roman B. which we possess, is probably that of Scipio Africanus the elder. During the empire, busts for the most part were accurate portraits, and still furnish us with the means of becoming acquainted with the features, not only of the emperors themselves, but of most other persons of distinction. Busts of poets and men of letters are far less frequently met with amongst the Romans than amongst the Greeks. The chief marks of the authenticity in these busts

are the names which very frequently are inscribed on them, and, where these are not found, the comparison which we are enabled to make between them and coins. Private collectors of busts were not unknown in antiquity, as, for example, M. Terentius Varro and Pomponius Atticus. In our own time, king Louis I. of Bavaria made, in his celebrated Valhalla, the most remarkable collection of busts which perhaps anywhere exists. The first complete collection of engravings from antique busts was made by Fulvius Ursinius in his *Illustrium Imagines* (Rome, 1569, and Antwerp, 1606). Recently, we have been indebted to Visconti's *Iconographie Grecque* (Paris, 1811) and *Iconographie Romaine* (Paris, 1817) for a similar collection.

BUSTAMEN'TE, Anastasio, 1782–1851; a physician of San Luis Potosi, Mexico. He was among the earliest supporters of Iturbide when the revolt against Spain began in 1821. In 1830, he became vice-president of the republic, exercising the full power of president. He resigned when Santa Anna's revolution of 1832 became successful, and the next year was exiled, living in Europe until 1836, but recalled after the downfall of Santa Anna, and in 1837 elected president. In 1846, he was president of the Mexican congress.

BUSTARD, *Otis*, a genus of birds, sometimes made the type of a family, *otidæ*, usually ranked in the order *grallæ* (q.v.). The general structure seems to agree best with that of the *grallæ;* but there are points of strong resemblance to gallinaceous birds, both in the appearance and habits of the bustards; while their power of running, and the use which they make of their wings to aid in running, are indicative of a relation to the *struthionidæ*, or ostrich tribe. They differ, however, from these birds in possessing wings quite capable of flight, although even when pressed by danger they often seek to escape by running, and the great B. of Europe has been pursued and taken by greyhounds.—Bustards are birds of bulky form, with long neck and long naked legs; the toes, three in number, all directed forward, short, united at the base, and edged with membrane; the wings rather rounded; the bill of moderate length, straight, or nearly so. They are mostly inhabitants of open plains, to which all their habits are adapted.—The Great B. (*otis tarda*) was at one time plentiful in some parts of England, and was also an inhabitant of the s.e. of Scotland; but extending cultivation, and the persecution to which it has been subjected, have now rendered it a very rare British bird. It is common in the s. and e. of Europe, and abounds in the wide steppes of Tartary. It is the largest of European birds, the male sometimes weighing nearly 30 pounds. The female is much smaller than the male. The plumage is of a pale chestnut color on the upper parts, beautifully varied with black—much white and black on the wings, the tail tipped with white. The tail is short, spreading, and rounded. A tuft or plume about 7 in. long, springing from the chin, passes backwards and downwards on each side, in the summer dress of the male, partly concealing a long stripe of bare skin on each side of the neck. The anatomy of the male exhibits a remarkable peculiarity in a large bag or pouch, capable of holding several pints, the entrance to which is between the underside of the tongue and the lower mandible. The use of this bag is unknown; but it has been conjectured to be for conveying water to the females and young, in wide, arid plains. The great B. feeds indiscriminately on animal and vegetable food, swallows frogs, mice, worms, etc., and is very fond of turnip-tops. Its flesh is highly esteemed for its flavor. It is polygamous. No difficulty is found in taming it, but all attempts to reduce it to a state of true domestication have hitherto failed, from its not breeding in the poultry-yard.—The Little B. (*O. tetrax*), frequently in the s. of Europe and n. of Africa, is only an accidental visitant in Britain. It is not half the size of the great B.—The Black-headed B. (*O. nigriceps*) is found in large flocks in the open plains of the Mahratta country. Its flesh is esteemed one of the greatest delicacies which India produces.—The Kori B. (*O. kori*) of s. Africa, a magnificent bird, standing upwards of five ft. in height, has a similar reputation as one of the best kinds of game.—Australia possesses a B. (*O. Australasianus*) somewhat exceeding the great B. of Europe in stature. It is called wild turkey by the colonists of New South Wales. Its plumage is finely freckled or spotted; the prevailing color is brown. It has become comparatively rare in the more settled districts, its flesh being particularly delicate and well flavored, but may be seen stalking majestically in the grassy plains, wherever human footsteps are still rare.

BUSTO-ARSI'ZIO, a t. of northern Italy, in the province of Milan, and 20 m. n.w. from Milan. It stands in a fertile plain, which produces much wine. In one of the churches are numerous statues and fine paintings by Daniel Crespi, a native of the town. Remains of ancient buildings show that Busto-Arsizio was in ancient times of considerable importance. It is a place of active trade, and has a cotton-thread factory. Pop. of town and suburbs, 12,909.

BUTADES (wrongly called Dibutades), a Greek modeler in clay, described as the first who copied the human face in that material. Seeing on a wall a drawing in outline of his daughter's lover, B. molded the face of it in clay, and baked it with the tiles which it was his business to make. The incident led B. to ornament the ends of roof-tiles with faces, a practice largely imitated in after years. He lived about 600 B.C.

BUTCHER-BIRD. See Shrike.

BUTCHER, Samuel, D.D. See page 885.

BUTCHER'S-BROOM, *Ruscus,* a genus of plants of the natural order *liliaceæ,* with male and female flowers on separate plants, a perianth of six leaves, filaments united, one style, and the fruit a berry. The common butcher's-broom (*R. aculeatus*) is a shrubby or almost shrubby evergreen plant, with a biennial stem, 1 to 3 ft. high, sending out many short branches and ovate alternate sharp-pointed false leaves of the same substance as the branches, the flowers minute and arising from the disk of the false leaves, solitary; the berries red, almost as large as wild-cherries, and of a sweetish taste. It is common in many parts of the s. of Europe, and in the s. of England in woods and hedges. The English name is derived from the use made of the plant by butchers, to sweep their blocks. It grows well under trees or shrubs, and can often be advantageously introduced for ornamental purposes. The root was formerly much used in medicine. It is aperient and diuretic.—*R. hypophyllum,* a native of Italy, had once a considerable reputation as a stimulant of the uterus.

BUTE, an island in the firth of Clyde, Scotland, separated from the coast of Argyle by a narrow winding strait, called the kyles of Bute, mostly under a mile wide, about 6 m. distant from the w. coast of Ayrshire, and 8 m. n. of Arran. It is about 16 m. long, of irregular breadth, and with an area of 60 sq. miles. The surface to the n. is high, rugged, and barren; in the center and s., it is low and undulating, and comparatively fertile. The highest point rises 875 feet. The coast is rocky and has some bays. The island has several small lakes. The climate is milder than in any other part of Scotland, and, though moist, less so than on the w. coast generally; hence, it is much resorted to by invalids. In the s. the soil is sandy; towards the n. clay predominates. Most of the arable land is under tillage, and agriculture is in a good state. The chief crops are oats, turnips, and potatoes. Pop. '81, 10,998. The principal town is Rothesay. Most of the island belongs to the marquis of Bute, whose beautiful seat, Mount Stuart, is about 4 m. s. from Rothesay. Among the antiquities of B. are Rothesay castle, Kames castle, Kilmorie castle, St. Blaine's chapel, Dungyle, a remarkable vitrified fort on a high crag on the s.w. coast, and the Devil's caldron, a circular erection, the original purpose of which is not well known. B. and the neighboring isles were for many centuries subject to the Norwegians.

Buteshire, a county in the s.w. of Scotland, comprising the isles of Bute (q. v.) and Arran (q. v.), and the Cumbraes, Holy isle, Pladda, Inchmarnoch, and other smaller islands. The area of the whole, according to the ordnance survey, is 225 sq.m., or 143,977 statute acres. The pop. in 1881 was 17,657. B. returns one member to parliament. The county town is Rothesay, in the island of Bute.

BUTE, John Patrick Crichton Stuart, third marquis, and reputed hero of Disraeli's *Lothair.* He joined the Roman Catholic church in 1868, and took great interest in furthering religious education, in pursuance of which he, among other enterprises, purchased land, and established near Jerusalem an asylum for pilgrims.

BUTE, John Stuart, third earl of, was b. in 1713, and d. in 1792. About 1737, he attracted the favorable notice of Frederick, prince of Wales, who made him one of his lords of the bedchamber. After the death of the prince, he became groom of the stole to his son, afterwards George III., over whose mind he obtained a strong influence. In Mar., 1761, he was appointed one of the principal secretaries of state; and from the 29th May, 1762, to the 8th April, 1763, he was prime minister. His government is memorable only as one of the most unpopular that ever held office in Britain, its fundamental principle being the supremacy of the royal prerogative, of which the executive government were merely the humble servants. Lord Bute was given to scientific pursuits, especially botany, and showed himself a liberal patron of literature and art. He married the only daughter of lady Mary Wortley Montagu.

BU'TEA, a genus of plants of the natural order *leguminosæ,* suborder *papilionaceæ,* remarkable for the great length of the *standard* of the flower, and having a compressed, one-seeded pod, membranaceous at the apex. The best known species are *B. frondosa* and *B. superba,* natives of India; and the former very widely diffused throughout that country, generally appearing as a sort of shrub in the neighborhood of villages, but in the jungles growing into a small tree. These trees present a gorgeous sight when covered with racemes of large deep scarlet flowers. They have trifoliate leaves, with roundish leaflets, velvety beneath. They yield a resinous exudation, which occurs in the form of lurid red tears, often covering the twigs, and is one of the kinds of lac (q. v.) brought to the market in India. The juice of the tree is not red, and the lac is supposed to be elaborated by insects, but of what species is unknown. *B. frondosa* is called the *dhak* tree in India. The bark and roots are very fibrous, and the fiber is used for calking boats. The flowers, called *teesoo* or *keesoo,* yield a beautiful yellow or orange dye.

BUTERA, a t. of Sicily, in the province of Caltanisetta, and 8 m. n.n.w. from Terranova. It stands on a height on the left bank of the Manfria. Ruins of great antiquity exist in the neighborhood, but the ancient name is unknown. In 853, B. was besieged for five months by the Saracens, who raised the siege on the surrender of 6000 persons as slaves. B. was almost the last town in Sicily taken by the Normans, having

held out against count Roger till 1089. The present castle is of Norman erection, and contains a number of medæval antiquities. Pop. 5150.

BUTIN, Ulysse Louis Auguste. See page 885.

BUTLER, a co. in s. Alabama; 875 sq.m.; pop. '80, 19,685—8983 colored; hilly, and mostly covered with pine woods; produces corn, cotton, etc. The Mobile and Montgomery railroad passes through. Co. seat, Greenville.

BUTLER, a co. in n.e. Iowa, on Cedar river and the Dubuque and Sioux City railroad; 576 sq.m.; pop. '80, 14,293; an agricultural region, mostly prairie. Co. seat, Butler Centre.

BUTLER, a co. in s. Kansas, on the White and Walnut rivers; 1519 sq.m.; pop. '80, 18,587. Agriculture is the chief business. Co. seat, El Dorado.

BUTLER, a co. in s.w. Kentucky, on Green river; 500 sq.m.; pop.'80, 12,181—820 colored. Surface uneven, with moderately fertile soil; agriculture the main business Co. seat, Morgantown.

BUTLER, a co. in s.e. Missouri, on the Arkansas border, w. of St. Francis river; 560 sq.m.; pop. '80, 6011—140 colored. It has a level surface and fruitful soil, producing corn, tobacco, etc. Co. seat, Poplar Bluff.

BUTLER, a co. in e. Nebraska, s. of Platte river; 576 sq.m.; pop. '76, 4730; in '80, 9194; productions agricultural. Co. seat, David city.

BUTLER, a co. in s.w. Ohio, on the Indiana border, intersected by Miami river, the Miami canal, and three railroads; 455 sq.m.; pop. '80, 42,580. Productions agricultural. Co. seat, Hamilton. There are in the co. many interesting monuments of aboriginal inhabitants.

BUTLER, a co. in w. Pennsylvania, near the Alleghany river, drained by the waters of the Beaver; 800 sq.m.; pop. '80, 52,536. The surface is diversified, and the soil sandy but tolerably good, producing the usual crops. Coal, iron, and limestone are plentiful. Co. seat, Butler.

BUTLER, Alban; an English hagiologist, 1710–73. He was educated at the Douay Roman Catholic college, where he was professor of philosophy, and afterwards of divinity. He traveled on the continent, was chaplain to the duke of Norfolk, and president of the English college at St. Omer's, where he died. The *Lives of the Saints* was his great work. It has passed through many editions.

BUTLER, Andrew Pickens, 1796–1857; a graduate of South Carolina college, and lawyer of South Carolina. He was in the legislature in 1824, and in 1833 was appointed judge of sessions and afterwards of the supreme court. In 1846, he was chosen U. S. senator. It was Mr. Sumner's reply to B.'s last speech in the senate that led to the assault upon the Massachusetts senator by Preston S. Brooks.

BUTLER, Benjamin Franklin, 1795–1858; a native of New York, and law partner of Martin Van Buren. He served in the legislature, and was a member of the commission to revise the statutes. In Jackson's cabinet he was attorney-general, 1831–34, and acting secretary of war, 1836–37. He was afterwards professor of law in the university of New York. He was a leading member of the Democratic party up to the time of the passage of the Kansas-Nebraska bill, after which he acted with the other party.

BUTLER, Benjamin Franklin, general of volunteers, U. S. army, was b. at Deerfield, N. H., Nov. 5, 1818. He graduated at Waterville college, Maine, in 1838, studied law at Lowell, Mass., where he was admitted to the bar in 1841, and became distinguished as a criminal lawyer and Democratic politician. He was a member of the state legislature in 1853, of the state senate in 1859–60, and a delegate to the Democratic national conventions at Charleston and Baltimore in 1860, where he supported the nomination of Jefferson Davis and John C. Breckenridge, and was nominated as the Democratic candidate for governor of Massachusetts. B. had risen to the rank of brig.gen. of militia; and at the outbreak of the war of secession, April 17, 1861, he marched with the 8th Massachusetts brigade, and after a check at Great Bethel, was appointed to the command of Baltimore, and subsequently of eastern Virginia, with his head-quarters at fortress Monroe. In Feb., 1862, he commanded the military forces sent from Boston to Ship island, near the mouth of the Mississippi; and after New Orleans had surrendered to the naval forces under commander Farragut, he held military possession of the city, and by his severity, and especially by an, at least apparently, atrocious order respecting the treatment of women, brought upon himself the intense detestation of the southern people, and a very general feeling of reprobation. Relieved of his command, he returned to fortress Monroe, acted under gen. Grant in his operations against Petersburg and Richmond, and, June 13, 1865, by his refusal to co-operate with the naval forces, caused the failure of the first attempt to take fort Fisher, the chief defense of Wilmington. Returning to Massachusetts at the end of the war, he took an active part in politics as an extreme radical, advocated the impeachment of president Johnson; in 1866, he was elected member of the house of representatives, and has been repeatedly elected until 1878.

*BUTLER, Benjamin Franklin (*ante*), b. N. H., 1818; a graduate of Waterville (Me.) college; admitted to the bar in Massachusetts, and acquired a large practice in Lowell and other cities. He was early in politics as a member of the Democratic party, and by them was chosen to the legislature in 1853. In the same year he was a member of the constitutional convention, and in 1859 was elected to the state senate. On the first call for troops in the secession conflict (April 15, 1861), B., who was a brig.gen. of militia, called out his brigade. On the next day, the 6th regiment left Boston; and on the 18th, B. at the head of the 8th regiment started for Washington by way of Baltimore. Two regiments of his brigade had in the mean time sailed for fortress Monroe, of which they took possession. The burning of railroad bridges prevented B. from reaching Washington directly, and he took possession of Annapolis and repaired the railroad from that city to Washington so speedily, that the 7th New York and the 8th Massachusetts regiments reached the capital in season to prevent any attempt at seizure. In May, he took possession of Baltimore without opposition, and the same month was appointed maj.gen. and given command of fortress Monroe. Here he made the declaration, when requested to return runaway negroes, that the slaves were "contraband of war"—a doctrine that greatly discouraged the secessionists and correspondingly elated the union side, for up to that period there had been no hesitation on the part of the civil or military authorities in doing their utmost to arrest and return fugitive slaves. In the spring of 1862, he commanded the land force of 18,000 men designed to co-operate with Farragut in command of the fleet to operate in the lower Mississippi, and on the 1st of May he took possession of New Orleans, where he remained until relieved by gen. Banks in Deeember. His administration in New Orleans was violently denounced: but he kept order; forced the people to keep reasonably clean streets and so avoided the yellow-fever for one season; compelled the rich seeessionists to contribute to the support of those whom their rebellion had reduced to want; and enforced due respect for the flag of the nation. Near the close of 1863, he was put in command of the department of Virginia and North Carolina, and in May, 1864, occupied City Point and Bermuda Hundred in support of Grant's movement upon Petersburg. In October he was sent to New York to assure peace during the election, there being danger of serious trouble. In 1864, he was sent against fort Fisher, but the enterprise failed, in consequence of a storm, and he returned, contrary to orders, for which he was relieved from command. In 1866, he was chosen member of congress from the Boston district, and in 1868, was one of the managers in the impeachment of president Johnson. From the breaking out of the rebellion until 1876–77, Butler acted with the Republican party; but when the greenback and labor movement began to take shape he favored it, and in 1878 was the candidate of those parties, and of a large portion of the Democratic party, for governor of Massachusetts, receiving 109,435 votes to 134,725 for the successful Republican candidate. He was again a candidate of "greenbackers," labor men, and Democrats, in 1879, but was again unsuccessful.
See *Supp.*, page 885.

BUTLER, Charles, 1750–1832; a prolific English writer, nephew of Alban. He was educated at Douay, and entered at Lincoln inn in 1775, coming to the bar in 1791. His literary activity was enormous. Among his works were *Reminiscences; Horæ Biblicæ; Horæ Juridicæ Subsecivæ; Book of the Roman Catholic Church;* and lives of Erasmus, Grotius, and others. He also edited his uncle's *Lives of the Saints,* and completed an edition of *Coke upon Littleton.*

BUTLER Clement M., d.d., b. N. Y., 1810; a Protestant Episcopal minister in Georgetown, D. C., Boston, and Washington; rector of Grace church, Rome, Italy, 1862–64; professor of ecclesiastical history in the divinity school of the Protestant Episcopal church in West Philadelphia. He has published *The Book of Common Prayer Interpreted by its History; Old Truths and New Errors; St. Paul in Rome; Inner Rome; Manual of Ecclesiastical History from the 1st to the 18th Century; Sermons, etc.*

BUTLER, Elizabeth Southerden. See THOMPSON, Elizabeth.

BUTLER, John, a native of Conn.; d. Canada, 1794; a tory leader in the revolution, commanding a regiment of militia. In 1776, he organized a band of guerillas disguised as Indians, who committed many outrages. He also commanded the men who destroyed Wyoming, Penn., in 1778. After peace he settled in Canada, where he was agent for Indian affairs.

BUTLER, Joseph, one of the most eminent of English divines, was b. in 1692 at Wantage, in Berkshire, where his father kept a shop. With a view to the ministry of the Presbyterian church, he attended a dissenting academy at Tewkesbury, in Gloucestershire. At the age of 22, he gave proof of high metaphysical ability in a letter to Dr. Samuel Clarke, usually appended to that celebrated writer's *a-priori* demonstration, to which it offers some objections. About this time, he made up his mind to join the church of England, and in Mar., 1714, entered Oriel college, Oxford. Soon after, he took orders. In 1718, he was appointed preacher at the Rolls chapel, where he preached those remarkable sermons which he published in 1726. The first three, *On Human Nature,* constitute one of the most important contributions ever made to moral science. The scope of the reasoning is briefly, that virtue is consonant with, and vice a violation of, man's nature. In 1725, B. was presented to the rich benefice of Stanhope, in the co. of Durham, to which he removed in the following year. Here he resided in great retirement till 1733. His friend Secker, the archbishop, desired to see him pro-

moted to some more important position, and mentioned his name once to queen Caroline. The queen thought he had been dead, and asked archbishop Blackburne if it were not so. "No, madam," said the archbishop; "but he is buried." In 1733, B. became chaplain to his friend lord chancellor Talbot, and at the same time a prebendary of Rochester. In 1736, he published the great work of which the germs were contained in his three sermons, and which has entitled him, in the eyes of his eloquent disciple Chalmers, to be called "the Bacon of theology." The leading aim of the *Analogy* is to show, that all the objections to revealed religion are equally applicable to the whole constitution of nature, and that the general analogy between the principles of divine government, as revealed in the Scriptures, and those manifested in the course of nature, warrants the conclusion that they have one Author. Soon after the publication of this work, B. was appointed clerk of the closet to the queen, who greatly prized his conversation. In 1738, he was made bishop of Bristol; in 1740, dean of St. Paul's; and in 1750, he was translated to the see of Durham. He lived only to make one visitation of his diocese. His "charge" on the occasion, in which he pointed out, with characteristic depth of insight, the importance of a due maintenance of the externals of religion, as a means of keeping alive the thought of it in the minds of the people, subjected him to much censure as betraying a tendency to Roman Catholicism—a charge unworthy now of serious notice. B.'s private character was such as became a Christian prelate: grave and judicious, he was at the same time meek and generous. His intercourse with his clergy and people was frank and humane; his episcopal treasures were wisely and munificently distributed, as not his own; and no anxious legatee looked with hope to his death. That event took place at Bath, June 16, 1752, and the good bishop's remains were buried in Bristol cathedral. His works, notwithstanding a dry and uninteresting style, have gone through numerous editions. The best is that edited, with a life, etc., by Fitzgerald.

BUTLER, Matthew Calvin. See page 885.

BUTLER, Samuel, poet, was b. at Strensham, Worcestershire, in 1612. His father was a farmer in that place, and said to be a person of some education. Young B., after acquiring the rudiments of his education at home, was placed at the college school at Worcester. His progress there was rapid, and on leaving it he proceeded to one of the universities. After finishing his education, he was appointed clerk to T. Jeffreys, esq., justice of the peace, and in his leisure hours devoted himself to the study of music and poetry. He afterwards entered the household of the countess of Kent, which he left, and went to live with sir Samuel Luke, who resided in the same county. After the king's restoration, he was made secretary to the earl of Carberry, which office he held till 1661. About this time, B. married a Mrs. Herbert, a lady of good family and some property, which, however, was afterwards lost by being invested in bad securities. He published the first part of *Hudibras* in 1663, and its reception at court was immediate and triumphant. It received all the favor Charles could spare from his spaniels and his mistresses, and he deigned even to garnish his royal conversation with its wit. The courtiers took up the fashion, the coffee-houses and taverns followed suit, and finally the mob went into raptures, in imitation of its betters. *Hudibras* was pirated within four weeks of its publication. The king had wit enough to see the merit of the work, but he lacked generosity to relieve the necessities of the writer. There seems to be no good reason to believe that B.'s palm ever tingled to the touch of royal pension or gratuity. Poverty is almost the only thing in B.'s life that one is certain of. In 1664, he published the second part of his book, and a third part appeared in 1678. He died in Rose street, Covent garden, in 1680; and while some say that he starved from pride, all agree that at his death he was very poor.

Hudibras is a kind of metrical *Don Quixote;* and if the work of Cervantes stands at the head of its class in the literature of Spain, *Hudibras* occupies the same place in the literature of England. The Puritans are the subjects of B.'s derision, and king Charles must have felt that the poet avenged for him the battle of Worcester. The weight, compression, and plenteousness of the wit is wonderful. *Hudibras* is like a mass of crystals, every point flashes. It is, beyond any other book, of wit "all compact." B. thinks in witty couplets, he argues in them, he spears his foes with a jest, he routs and chases them into oblivion with unextinguishable laughter. His best things have become proverbs. His mass of wit has been grated down into common speech, and particles of it may be found any day glittering in the talk of English plowmen and artisans.

BUTLER, William Allen, ll.d.; b. N. Y., 1825; a graduate of the university of New York, studied law with his father (Benjamin F. of New York), and traveled extensively abroad before commencing practice. He is the author of several popular satirical poems, among which are *Nothing to Wear; Barnum's Parnassus;* and *Two Millions.* He has also published *Lawyer and Client,* and a biographical sketch of Martin Van Buren.

BUTLER, William Archer, a religious and philosophical writer of singularly high promise, was born in 1814, at Annerville, near Clonmel, Ireland. He was originally a Roman Catholic, but subsequently became a Protestant, and studied at Trinity college, Dublin, where he was appointed professor of moral philosophy in 1837. He died in 1848. The principal work on which his reputation is based, is the *Lectures on the History of Ancient Philosophy,* edited with notes by W. Hepworth Thomson (Cambridge, 1856, 2

vols.). These lectures are remarkable for their great learning, eloquence, and depth of judgment. Besides his lectures, there have appeared, *Sermons,* with a memoir by the Rev. Thomas Woodward (Dublin, 1849); *Letters on the Development of Christian Doctrine* (Dublin, 1850); *Letters on Romanism* (Lond. 1854).

BUTLER, William Orlando, 1793–1880; b. Ky.; served in the Indian battles of 1812, and under Jackson at New Orleans, and after the war praeticed law in Kentucky. He was a member of congress, 1839–43, and next year demoeratic candidate for governor; in 1848 the democratie nominee for vice-president, but not successful. He served as maj. gen. of volunteers in the war with Mexico, and was wounded at Monterey. He was a member of the peaee congress of 1861.

BUTLERAGE OF WINE, as described by Blackstone and Stephen, is a very ancient hereditary duty belonging to the crown, and is otherwise called the *prisage* of wines. This duty is taken notiçe of in the great roll of the exehequer, 8 Riehard I., still extant. Under the right to levy it, the crown could take two tuns of wine from every ship (English or foreign) importing into England 20 tuns or more, one before and one behind the mast; which, by charter of Edward I., was exchanged into a duty of two shillings for every tun imported by merchant strangers, and called butlerage, because paid to the king's butler.

BUTO, an Egyptian goddess, deity of the town Buto in northern Egypt. She personified lower Egypt; and, it was believed, presided over fire, and resided in the sun. B. was considered to represent the Greek Latona, and to be the regent of certain districts and cities in Egypt and Arabia.

BU'TOMUS, a genus of aquatic plants, of which one species, *B. umbellatus,* is frequent in ditches and ponds in England, Ireland, and many parts of Europe, but is very rare in Scotland. It is popularly called flowering rush, and is one of the plants to which the praise has been assigned of being the most beautiful in the British flora. The leaves are all radical, 2 to 3 ft. long, linear, triangular, their sharp edges sometimes eutting the mouths of cattle, whence the generic name (Gr. *ox-cutting*). The seape, or flowering stem, is longer than the leaves, terminating in a large umbel of rose-eolored flowers, readily distinguished from those of all other British plants by having nine stamens, six in an outer, and three in an inner row.

BUTT, Isaac, b. 1813; graduate of Trinity college, Dublin, and a member of the Irish bar. He was one of the counsel for Smith O'Brien and others tried in 1848 for treason, and also for the Fenians tried in 1865. In 1852, he was chosen to parliament from Younghall as a liberal conservative; and in 1871 he was returned from Limerick as a "home ruler," and has been to the present time the chief leader and support of the idea which that name involves. He was one of the projeetors, and for a time the editor, of the Dublin *University Magazine.* He has also published *Literature of Political Economy; History of the Kingdom of Italy,* and works on the relations of landlord and tenant. He died in 1880.

BUTTE, a small hill or knoll, or rising ground; in some places applied to mountains, as the Downieville Buttes in California, which are nearly 9000 ft. high.

BUTTE, a co. in. n. California, on the Sacramento and Feather rivers; 1458 sq.m.; pop. '80, 18,721. The surface is rough and well wooded, and the soil fertile. The co. is rieh in gold, silver, platinum, cinnabar, lead, and iron. The Marysville branch of the Paçific railroad crosses the w. portion. Wheat, barley, wine, and wool are the chief agricultural productions. Co. seat, Oroville.

BUTTER (Ger. *butter;* Fr. *beurre;* Lat. *butyrum*) is the fatty substance present in the milk of the mammalia, and capable of being extracted from it. In ancient times the Hebrews seem to have made copious use of butter as food; but the Greeks and the Romans used it only as an ointment in their baths, and it is probable that the Greeks obtained their knowledge of the substance from the Seythians, Thracians, and Phrygians, whilst the Romans obtained it from Germany. In southern Europe, at the present time, B. is very sparingly used; and in Italy, Spain, Portugal, and southern France, it is sold by apothecaries as a medicinal agent for external applieation. The amount of B. in cows' milk (q.v.) is about 4 per cent, though the kind of pasture, quantity of milk, and general condition, influence the relative quantity of the several ingredients of milk. In the extraction of B., the milk is allowed to cool, and the cream which rises to the surface is skimmed off, and put into a large, deep, earthenware vessel, where it lies for several days till enough has been collected for a *churning.* Any difference in the exact mode of treatment of the milk yields a B. with some peculiarity or other. Thus, the B. and cream of Devonshire, which are famed for their superior richness, owe this in greater part to the mode of manipulating the milk, and not to the special charaeter of that fluid, or to the richness of the pastures in those districts. The milk in Devonshire is not allowed to cool slowly, as elsewhere, but is at once placed in large deep pans, and carefully heated. A scum quickly rises, which is pushed to the side; and whenever the bubbles of steam appear, the milk is removed, and allowed to cool in the ordinary way, when a good deal of the milk thickens to the consistence of B., and is skimmed off as the celebrated *Devonshire clouted cream.* In England, the B. of Epping and Cambridge is highly esteemed, and in every part of Great Britain, the Dutch B., in a salted form,

is very largely consumed; indeed, three fourths of all the foreign B. consumed in Great Britain is imported from Holland.

In order to separate B. from milk, recourse is always had to the process of agitation in churns (q.v.). The principle involved in each and all forms of this apparatus is the thorough agitation of the contents, so as to cause the rupture of the minute fat globules present in the milk, and the incorporation of these ruptured fat globules into larger or smaller masses of butter. The cream is strained through cloth into the churn, to remove any foreign matter; and the agitators being set in motion, the friction of the movement, combined with the admission of air, and the chemical changes it induces, raises the temperature of the whole contents. At one time, it was thought that one great object of the agitation was the admission of the oxygen of the air, which becoming thoroughly incorporated with constituents of the milk, combined therewith, and, as a consequence, led to the separation of the butter. It is found, however, that B. can be obtained from milk by mere agitation, without the admission of the oxygen of the air. At the same time, in the ordinary way of churning, oxygen does play a subordinate part by combining with the sugar of the milk, and forming lactic acid, which in its turn *sours* the milk, and separates therefrom the caseine (q.v.)—cheese-matter—in minute clots or flakes, yielding what is commonly called *sour* or *butter milk*. The process of churning must be conducted at a medium rate. If too quickly performed the B. is soft and frothy, and is said to *burst;* whilst when too slowly made, it is highly tenacious, strong tasted, and badly flavored. When all the B. has *come*, which is known by the particles agglutinating into irregular masses, the B. is *made* by taking the lumps, and well washing and kneading them on a wooden board in a tub of pure spring-water till all the butter-milk has been expressed; it is then divided into the requisite size of lumps, fashioned into rolls, or molded into forms, and usually stamped with some device. In the making up of the B. the hands of the operator must be scrupulously clean, and be free from the slightest taint of soap. Persons who are subject to moist hands should never knead B., as it is very liable to be contaminated by the slightest foreign matter, especially animal secretions; and it is better always for the operator to wash the hands with water containing some oatmeal before commencing. So important is this source of contamination regarded in America, that every endeavor is made to get quit of manual labor in working the B., and a wooden *butter-worker* has been invented, and is largely used there. When newly prepared, the B. is called *fresh* or *sweet* B., and is of a yellow color, which is well known to be deeper as the pasture on which the cows have been fed is richer, and hence the poorer kinds of B. are often artificially colored with arnotto (q.v.).

A large quantity of the B. sent into market has more or less common salt added, for the purpose of preserving it. For use within a week or two, the proportion of common salt employed is about ½ an oz to 2 lbs. of B., though, where it has to be kept for some time, as much as 1 oz. of salt to 1 lb. of butter is used. The incorporation requires to be carefully and dexterously done, so that the resulting material may be uniform; and the better plan is to add only a portion of the salt at a time, and to knead and re-knead the B. till the whole is thoroughly mixed. When the less amount of salt has been employed, the result is *powdered* B., and the larger quantity yields *salt* butter. Much of the latter is closely packed in small wooden firkins or *kits*, and occasionally in stoneware, and sent into market. Great care must be taken to have these kits, and indeed to have every vessel used in the preparation, as clean or *sweet* as possible. Constant rinsings with cold water, and scaldings with boiling water, are resorted to. Attention must likewise be paid to the air of the apartments in which the operations are carried on, as a tainted air is very injurious.

The adulterations liable to be present in B. are an undue proportion of salt and water, and these run up occasionally to upwards of 33 per cent, or one third of the total weight. Another adulteration is the presence of lactate of zinc, derived from the milk being placed in zinc pails and basins, from the impression that by some imaginary electrical influence an increase in the amount of cream will be the result; but though this is not attained, yet the milk tending to form lactic acid, the latter attacks the zinc vessel, and forms lactate of zinc, which dissolves in the milk, and thereby contaminates it, imparting an unpleasant taste, and, when present in larger quantity, leading to violent spasmodic vomiting. When B. is allowed to get old, it becomes rancid and tastes and smells disagreeably. To some extent an acid is formed, called butyric acid (q.v.). For the use of B. in diet, see Food and Nutrition.

Butter, in chemistry, is often applied generically to any substance of the same consistence of B., and is therefore used to designate palm, cocoa-nut, shea, and nutmeg oils. It is also applied to certain metallic substances which have an oily aspect and consistence resembling melted B.; thus we have B. of antimony, bismuth, zinc, and tin.—Butter of antimony is a thick, dense, oily compound, produced by acting upon the native sulphuret of antimony (SbS_3) by concentrated hydrochloric acid (HCl) and heat, when the oily chloride of antimony ($SbCl_3$) is formed. See Antimony.

Butterine, a substitute for B., was first manufactured in France, but is now extensively produced in this country. It is composed of animal fat, amalgamated with milk, to which is sometimes added a small proportion of real butter.

Butter, Rock, a mineral which may be regarded as a variety of alum (q.v.)—an iron alum, appearing as a pasty exudation from rocks that contain alum or its constituents,

particularly alum-slate and other schistose rocks. It occurs at Hurlet alum-work, near Paisley, Scotland, and in a number of places on the continent of Europe. It is not unlike B. in color, varying from yellowish white to sulphur yellow. It is rather greasy to the touch, and is easily broken in pieces.

BUTTERCUP. See RANUNCULUS.

BUTTERFIELD, JOHN, 1783–1869; one of the founders of the express business in the United States. Before the time of railroads he was proprietor of many important lines of stage coaches, especially in New York state.

BUTTERFIELD, WILLIAM, b. 1814; an English architect noted as a leader of the "Gothic revival" in England. His work has been chiefly in church and collegiate architecture.

BUTTERFISH. See GUNNEL.

BUTTERFLY, the common English name of all the diurnal lepidopterous (q.v.) insects, corresponding with the genus *papilio*, as originally defined by Linnæus, but forming many genera in the most recent entomological systems. Butterflies exhibit a great similarity in almost all respects to other lepidopterous insects, the common characters of which will be found in the article on that order; but are distinguished even more than the rest of them generally, by brilliancy of coloring, which in butterflies also belongs to the under as well as the upper side of the wings, whilst the beauty of moths and hawk-moths appears chiefly on the upper side. Accordant with this circumstance, is the further peculiarity, that almost all butterflies, when at rest, usually hold their wings erect, the under side being thus chiefly exhibited; whilst the other lepidopterous insects, when at rest, hold their wings in a horizontal or somewhat inclined position, and some have them wrapped round the body. Butterflies are also the only lepidopterous insects which have no spines, bristles, or hooks on the margins of their wings, by which the second wing on each side can be attached to the first, but both when flying and at rest, have all their wings quite separate. The manner in which the scales of the wings are imbricated, gives those of butterflies a smoother appearance than those of moths and hawk-moths. The antennæ of butterflies are generally simple, slender, and elongated, and terminated by a little club. Their caterpillars have always sixteen feet (see CATERPILLAR). The pupa or chrysalis is angular; is seldom enveloped in a cocoon; is generally suspended by the tail, by means of a silky substance, often to a leaf or twig, but is sometimes supported by bands around the middle; and generally exhibits more or less of that golden coloring from which both the names *aurelia* (Lat. *aurum*) and *chrysalis* (Gr. *chrysos*) are derived.

Butterflies are found in all parts of the world; they are to be seen during the sunshine of the brief summer extracting nectar from the flowers even of Greenland and Spitzbergen, but they are most numerous in the warmest regions; where, however, many of them live chiefly in the shade of moist foliage, in woods and jungles. Dr. Hooker, describing the scenery on the banks of the Great Runjeet in the Sikkin Himalaya, says that "by far the most striking feature consisted in the amazing quantity of superb butterflies, large tropical swallow-tails, black, with scarlet or yellow eyes on their wings. They were seen everywhere, sailing majestically through the still hot air, or fluttering from one scorching rock to another, and especially loving to settle on the damp sand of the river edge, where they sat by thousands, with erect wings, balancing themselves with a rocking motion, as their heavy sails inclined them to one side or the other, resembling a crowded fleet of yachts on a calm day."

Butterflies possess no small power of wing; some of them, indeed, of which the wings are comparatively thin and delicate, are inferior in this respect, and have a sort of zigzag flight; but others soar in the air with a steady and continuous motion. Short-lived as they are all generally believed to be, some of the tropical species perform wonderful migrations; concerning which, however, nothing but the fact is yet well known. "Frequently," says sir James Emerson Tennent in his work on *Ceylon*, "the extraordinary sight presents itself of flights of these delicate creatures, generally of a white or pale yellow hue, apparently miles in breadth, and of such prodigious extension as to occupy hours and even days uninterruptedly in their passage, whence coming no one knows, whither going no one can tell."

The number of species of B. is very great, and the arrangement of them has been found difficult, chiefly upon account of the great similarity in all important respects which prevails among them all. They are divided, however, into two well-marked sections, of which the first is characterized by having only a single pair of spurs or spines on the *tibiæ* (or fourth joints of the legs), placed at their lower extremity; whilst in the other section, the tibiæ of the hinder legs have two pair of spurs, one pair at each extremity. This distinction, seemingly unimportant in itself, is accompanied by other differences. The second section of butterflies may be regarded as forming a sort of connecting link between butterflies and hawk-moths. A few British species belong to it, but the species are generally tropical, and some of them, found in tropical America, are remarkable for their rapidity and power of flight, and for the migrations which they perform, besides being amongst "the most splendid insects in creation," a resplendent green, inimitable by art, relieving the velvet black of their wings, and varying with

every change of light. The beautiful iridescence of the wings of these and many other butterflies is owing to the peculiar position of the scales.

Some groups of butterflies are remarkable for the imperfect development of the first pair of legs, so that they are generally described as having four legs instead of six.

The eggs of butterflies are deposited on the plants, the leaves of which are to supply the food of the caterpillars. In cold and temperate climates, the eggs deposited in autumn arenot hatched till the following spring; but it is believed that many speeies produce several broods in a year, as the eggs in summer may be hatched in a few days. The caterpillars of each species are generally eonfined to some particular kind of plant, the leaves of which they devour; their ravages are well known, but the excessive increase of their numbers is in part restrained by many enemies, and by none more than by the ichneumons (q.v.) and other insects, which deposit their eggs in them, and the larvæ of whieh feed on them. An account of B. transformations will be given under INSECT TRANSFORMATIONS.

Butterflies vary in size from less than an inch to almost a foot across the expanded wings. The largest species are tropieal. Some of the species are very widely distributed: *Cynthia cardui*, of which the caterpillar feeds on the leaves of thistles, is found not only throughout Europe, but in Egypt, Barbary, Senegal, Cape Colony, Madagascar, China, Java, Australia, Brazil, and North Ameriea, being, in fact, one of the most widely distributed of all insects. The geographical limits of other species appear to be very restricted. The diversity of coloring is almost endless, but a prevalence of certain hues, or of certain modes of the disposal of them, is observable throughout large groups. The caterpillars of many speeies are variously furnished with spines, those of others—none of them British—have long fleshy prominences, horny at the tip, probably intended as means of defense. The hinder wings of many butterflies are curiously prolonged into tail-like appendages, one or more on each wing, which vary in form, being sometimes long and linear, sometimes broad, and widening towards the extremity. These are, however, little seen in British speeies.

Butterflies are ehiefly known to us as objects of admiration and of pleasing contemplation, enhancing the charms of the most delightful weather, and always assoeiated with the most lovely scenes, or—it must be added—as a cause of annoyanee and vexation by the ravages of their caterpillar young in our fields and gardens. There is, however, one small species (*euplæa humata*) whieh affords a supply of food to some of the wretehed aborigines of Australia. Butterflies of this species congregate in such vast numbers on the masses of granite in the mountains, that they are collected by simply making smothered fires under the roeks, in the smoke of which they are suffocated. Bushels of them are thus proeured, and they are baked by plaeing them on the heated ground, the down and wings removed, and the bodies made into eakes which resemble lumps of fat. The months of Nov., Dec., and Jan. are quite a season of festivity from the abundance of this food.

Brief notices of a few of the principal kinds of B. will be found in other parts of this work. See CABBAGE BUTTERFLY, CAMBERWELL BEAUTY, PURPLE EMPEROR, etc.

BUTTERFLY FISH. See BLENNY.

BUTTERFLY WEED, or PLEURISY ROOT, *Asclepias tuberosa*, see ASCLEPIAS; a plant found in all parts of the United States, and which has obtained a considerable reputation for the medicinal virtues of its root. The root is large, formed of irregular tubers or spindle-shaped branches, externally yellowish brown, internally white, with a somewhat aerid nauseous taste when reeent, merely bitter when dried. It yields its properties to boiling water, and is usually administered in the form of a decoction, sometimes in that of a powder. It is diaphoretic and expectorant, and has been found useful in the eommeneement of pulmonary affections, in rheumatism, and in dysentery.—The stem of the plant is ereet and hairy, with spreading braneheS; the leaves oblongo-lanceolate, alternate, hairy, and somewhat crowded; the flowers orange-yellow, forming numerous umbels.

BUTTERMILK is the form of milk from which the butter or oily matter has been abstraeted. See BUTTER. B. contains the easeine, sugar, and salts of ordinary milk, and is only defieient in oily matters. It is therefore nutritious, and is largely used in Ireland and Seotland as an article of food, being very generally partaken of with porridge and with potatoes. It may be drunk *ad libitum*, is a very agreeable, cooling beverage, and is therefore useful in certain febrile and inflammatory conditions.

BUTTERMILK FALLS, in Le Roy, Genesee co., N. Y., on Oatka creek, which falls over a limestone ledge 90 ft. high. The same name is given to a cascade in Bog Meadow creek, near West Point, N. Y.

BUTTERNUT, or WHITE WALNUT, *Juglans cinerea*, a large, wide-spreading American tree, with nearly smooth bark, and large leaves. The nuts are well-known, and form agreeable food when dried; when taken green and pickled they are prized for the table. Sugar can be made from the sap, but it is much inferior to that made from maple. The timber is useful for coach and cabinet work, posts, rails, and wooden bowls.

BUTTER TREE, a name given to several tropical trees, of different natural orders, the fruits of which yield concrete fixed oils, having the appearance and used for the pur-



BUTTERFLIES, BEETLES, ETC.—1. Pectinate borer. 2. Fiddler. 3. Larva of same. 4. Meal-worm. 5. Larva of same. 6. Woolly beetle. **7.** Scarlet beetle. 8. Melandria. 9. Hispa. 10. Oil-beetle. 11. Spanish-fly. 12. Ordemerus. 13. Pea-beetle. 14. Corn-weevil. 15. Vine-weevil. 16. Clover-bug. 17. Bark-weevil. 18. Plum-tree weevil. 19. Capricorn beetle. 20. Leaf-bug. 21. Tenebrion. 22. Lady-bug. 23. Bee-eater. 24. Hind-legs of working-bee. 25. Honey-bee queen ; 26. drone ; 27. worker. 28. Wasp. 29. Sand-wasp. 30. Day-wasp. 31. Spider-ant. 32. Cockchafer. 33. Geometra brumata. 34. Blind-beetle. 35. Little-bellied wasp. 36. Buzz-wasp. 37. Glow-worm. 38. Rose-gall fly. 39. Plum-wasp. 40. Larva of same. 41. Rape-plant wasp. 42. Larva of same. 43. Pear wasp. 44. Larva of same. 45. Grain-wasp. 46. Swallow-tail. 47. Larva of same. 48. Pupa of same 49. Bear-moth. 50. Larva of Admiral butterfly. 51. Pupa of same. 52. Big-head. 53. Glass-moth. 54. Cone-moth. 55. Willow-weevil. 56. Hornet. 57. White-spot. 58. Silk worm, male ; 59. female. 60. Caterpillar. 61. Pupa. 62. Plusia gemma. 63. Cabbage-worm. 64. Grape insect. 65. Larva of same. 66. Honey-moth. 67. Earwig.

poses of butter. The B. trees of India and Africa belong to the genus *bassia* (q.v.), of the natural order *sapotaceæ;* the B. trees of Guiana and Brazil to the genus *caryocar* (q.v.), of the natural order *rhizobolaceæ.* The oil-palms (q.v.), and the *cocos butyracea* (see Cocoa Nut), may also be regarded as B. trees, although not generally receiving that name.

BUTTERWORT, *Pinguicula,* a genus of plants of the natural order *lentibulariaceæ* (q.v.), distinguished by a two-lipped calyx, the upper lip trifid, the lower bifid; a spurred corolla, two-lipped and gaping, the upper lip arched; and a globose germen. The species are small plants with only radical leaves, found in the bogs and marshes of different quarters of the world. Some of them possess much beauty when in flower, particularly *P. grandiflora,* a rare native of the s. of France and of Ireland. The common B. (*P. vulgaris*) is abundant in the northern parts of Britain and of Europe. It has the power of coagulating milk. The Laplanders pour reindeer milk, warm from the animal, upon the leaves of this plant, instantly strain it, and set it aside for two or three days, till it acquires the consistence of cream, and some degree of acidity, when it is with them a favorite article of food. A little of it in this state will produce the same effect on warm reindeer milk which was at first produced by the leaves of the plant. The origin of the English name B. is sometimes referred to the power of coagulating milk, sometimes to the peculiar sliminess of the leaves.

BUTTERWORTH, Hezekiah. See page 885.

BUTTISHOLZ, a village of Switzerland, in the canton of Lucerne, and 11 m. n.w. from the city of that name. Near to B. is a large mound called the English Barrow, because here are buried 3000 Englishmen, followers of De Coucy, son-in-law of Edward III. of England, who, while devastating the cantons, were defeated and killed by Swiss peasants in 1376.

BUTTMANN, Philipp Karl, one of the most distinguished philologists of modern times, was b. at Frankfort-on-the-Main in 1764, and studied at Göttingen under Heyne. He became, in 1789, assistant in the royal library in Berlin, and rose successively to be secretary and librarian (1811). He held at the same time (1800–8) a professorship in the Joachimsthal gymnasium in Berlin, which he afterwards exchanged for a professorship in the newly founded university of that city. He died 21st June, 1829. B. is best known by his Greek grammars, the *Griech. Grammatik* (Berl. 1792; 21st ed. by his son, Alexander Buttmann, 1863), and an abridgment of it, *Griech. Schulgram.* (14th ed. 1862); both have been translated into English. His *Lexilogus* (translated by Fishlake) and *Ausführliche Griech. Sprachlehre,* or larger Greek grammar, which have gone through several editions, are designed for scholars. In his *Mythologus,* he has collected his essays on the myths of the ancients.

BUTTON. The term B. is applied to the well-known appendages to dress used for fastening or for ornament; and to a sort of oblong latch moving upon a pivot in the middle, used by joiners and cabinet-makers for fastening the lids of boxes, doors of presses, etc. The mass of fused metal found at the bottom of a crucible or cupel, after fusing or assaying, is also technichally called a button.

The history of button-making is in many ways a curious one. Dating no further back as a trade of any importance than the reign of Elizabeth, it has undergone several extraordinary changes, produced chiefly by the ever-varying fashions in dress, but also by some simple, though ingenious inventions, as well as by foreign competition. In Great Britain, Birmingham has always been the principal seat of the button manufacture. What has been called the "Augustan age" of button-making in that city included the latter portion of last and the early part of the present century, when even tradesmen wore coats "loaded with innumerable gilt buttons," and when employers on a moderate scale in this manufacture were making incomes of from £2000 to £3000 a year, and their workmen from £2 to £4 per week. Early in the present century, Mr. B. Sanders introduced the cloth-covered button, which initiated the change from those made of metal, and by which he rapidly made a fortune. His son, in 1825, effected the apparently trivial but really ingenious improvement of making it with a canvas tuft instead of a metal shank, by which both the button-holes and the garment itself were less subject to injury. This kind of button had an enormous sale, and is still much used. A further alteration was made on it by Mr. W. Elliott, who patented, in 1837, a mode of covering the button with silk, having a pattern in the center, the demand for which was at one time so great, that sixty looms were employed in London in making the special material required for them. In 1841, the old Dorsetshire wire and thread button was replaced by the "three-fold linen button," still considered by housewives indispensable for under-clothing, since neither washing nor mangling destroys it. It is said to be the invention of Mr. H. Jeffries, of Birmingham, but was patented by Mr. J. Aston, and continues to be made in vast numbers. A single English firm recently consumed in one year for this kind of button, 63,000 yards of cloth and 34 tons of metal, upon which 250 hands were employed.

Turning now to other materials which have had a great "success" in their day, we find that buttons made of hoof, under the name of "horn buttons," as introduced nearly 40 years ago by Mons. E. Bassot of Paris, were for a good many years most extensively manufactured at Birmingham, and sent to all parts of the world. In hoof buttons the trade is now comparatively insignificant, and the French makers possess the market for what of it remains. Tweed clothing and fabrics in imitation of it have, through the

necessity of matching their various colors, led to the buttons for them being made of a rather uncommon material, namely, vegetable ivory (q.v.). This substance, which is the fruit of a palm, somewhat resembles true ivory, but is rather softer. It can be readily turned in the lathe, and dyed of various colors. More than twenty tons of it, valued at from £25 to £30 per ton, are weekly consumed in Birmingham in making buttons, and it is also largely used for the same purpose in France and Germany.

What we have hitherto said refers principally to what manufacturers call the revolutions of the trade; but there are other important branches which have been less subject to change, chief among these being the so-called "pearl buttons"—that is, buttons made of mother-of-pearl shells. This has long been a leading branch, and employs a greater number hands than any other. Metal buttons, too, although not relatively so important as formerly, have never ceased to form a prominent section of the trade. They are a numerous class, and include all sorts for uniforms, trouser buttons, fancy buttons which are gilt, stamped, chased, or enameled, and many cheap varieties in iron and other metals for export. Numerous kinds of composite buttons are also partly composed of metal. Glass buttons form another interesting branch, carried on to a considerable extent in Birmingham, but more largely in Bohemia and Paris; so also do porcelain buttons, which, although an English invention, are now almost exclusively made in France. Vulcanite (q.v.) buttons have been extensively made in the United States. As to other materials, a Birmingham manufacturer says it were easy to write out a long list from which buttons have been made, but very difficult to name one from which they have *not* been made.

We shall now describe briefly some of the processes in button-making, beginning with metal buttons. Circular disks, called "blanks," are first cut out of sheet brass or other metal by means of fly-presses, usually worked by girls. The fly-press consists of a vertical iron screw with a triple thread, to which screw is attached a horizontal arm, bending downwards at the end to form a handle. A punch attached to the press rises and falls with the motion of this handle, and rapidly cuts out the blanks. When large quantities of one pattern are required, a self-feeding, self-acting machine is used, which cuts out the blanks in rows at one blow, turning them out at the rate of 2000 gross per day. After being annealed, the blanks are next made convex by a blow from a stamp. The shanks are formed of wire by a separate machine, which cuts off pieces, and bends them into loops of the required form. When these are soldered on, the buttons are dressed on a lathe. They are then gilded and burnished; some, however, are only lackered; and some, though gilt, are finished in a dead or frosted style.—"Shell" buttons are those with a convex face, a flat or convex back, and hollow. These are made of two blanks, that forming the face being larger than the back to which the shank is attached. These blanks are pressed into the required shape by dies worked in the fly-press, and then, by another die, the edge of the larger blank is lapped over the smaller, and thus attached without soldering. Livery and other buttons having a device in strong relief are stamped by a die placed in a stamping-press. See Stamping of Metals.

In making covered buttons, a metal blank is punched, and its edge is turned up by a die in a fly-press; then a smaller metal blank is punched with a hole in the middle, and of such size, that, when flat, it shall fit into the upturned edge of the first: this perforated blank, or *collet*, is next pressed into a concave or dished shape. Two cloth blanks—the face one of silk, and the other for the tuft of thin canvas—are now punched, one considerably larger than the front metal blank, the other somewhat smaller; the larger cloth blank is laid upon the flat face of the metal blank, which is filled with a disk of mill-board or paper, and its edges turned over; these edges are covered by the smaller cloth, and then the collet laid upon them with its concavity towards the cloth. They are now all pressed together in a sort of die or mold, by which means the collet is flattened and spread out, while the upturned edge of the metal blank is turned forcibly over it, thus securing the collet, and with it the cloth which is strained tightly on the face, and its edges bound between the blank and the collet, so that the whole is firmly held together. The linen-covered button for underclothing, above referred to, is formed of a single brass ring with a groove or canal on one face. Into this the edges of the two round linen blanks are placed, so that when the edges of the groove are pressed firmly down, the button is entirely covered with linen.

Buttons with holes, technically called "four-holes," "three-holes," and "two-holes," when of pearl-shell, wood, bone, or ivory, are cut with a tubular saw, turned separately in a lathe, and drilled. When of metal, the blanks are punched, then stamped in dies to the required form; the holes are punched, and "rymered," to round the sharp edges that would otherwise cut the thread.—Glass buttons are most largely made by taking a rod of glass of any color, softening the end by heat, and pressing it into a mold, each half of which is fixed to one limb of a pair of pincers. The shank is placed into a hole in the mold before the melted glass is inserted.

According to an estimate published a few years ago by Mr. J. P. Turner of Birmingham, to whose paper we have been much indebted, the number of artisans employed in the button manufactures of that city was then as follows:

Making metal buttons of all kinds	1200
" covered buttons, including linen	1500
" pearl buttons	2000
" vegetable ivory buttons	700
" other kinds, as glass, horn, bone, wood, etc	600
Total	6000

Probably about 1000 more are employed in London and elsewhere in Great Britain, and a large proportion of the whole are females. At that time, which was before the war with Germany, about 20,000 persons were employed in France, showing how much more largely the button industry has been developed in that country. Germany is a still greater producer, the cheaper kinds of fancy buttons made in the Rhenish provinces of Prussia, the glass buttons of Bohemia, and the pearl buttons of Vienna being more extensively exported than those of any other country. Buttons of various kinds are made on a large scale in the United States, but that country still imports them largely from Europe.

BUTTON, Sir THOMAS, the successor of sir Henry Hudson in the exploration of the n.e. coast of America. In 1612–13, he was frozen in and wintered on the w. coast of Hudson's bay. The next summer he explored all the coasts of the bay, returning to England in the autumn.

BUTTONWOOD. See PLANE.

BUTTRESS (old Eng. *botress;* Fr. *buttée*), a projection for the purpose of giving additional support or strength to a wall. In the classical style, there were no buttresses, their place being, to a certain extent, supplied by pilasters, antæ, etc. The different stages of Gothic architecture are marked by the form of buttresses employed, almost as distinctly as by the form of the arch. The Norman B. was broad, often semicircular, sometimes dying into the wall at the top, and never projecting from it to any great extent. Early English buttresses project much more boldly, and are considerably narrower, than the Norman. They are frequently broken into stages, which diminish in size as they ascend. In the decorated style, this division into stages is almost invariable, the B. being often supplied with niches terminating in pinnacles, and very highly ornamented with carving, statues, etc. In the perpendicular style, they retain the forms which had been introduced during the decorated period, the ornamentation, of course, being varied to suit the character of the style. Flying buttresses—i.e., buttresses in the form of a sloping arch, connecting the upper and central portions of an arched structure with the vertical buttresses of the outer walls—were introduced into England at the period of the early English, though they existed on the continent previously, where they continued to be used to a greater extent. They were also very common in Scotland. In England, they are generally called arch-buttresses.

BUTTS, a co. in central Georgia, on the Ockmulgee; 240 sq.m.; pop. '80, 8311—4034 colored. The surface is uneven, and soil fertile. Productions, corn, cotton, and sweet potatoes. Co. seat, Jackson.

BUTUA ROOT. See CISSAMPELOS.

BUTY'RIC ACID may be best obtained by saponifying butter with potash, then adding dilute sulphuric acid till an acid reaction is attained, and distilling about one half of the mixture, adding a little water, and continuing the distillation till the residue is not acid. B. A. may also be obtained by allowing a small quantity of milk-curd to act upon a solution of sugar at a temperature of 77° to 86°, which excites a peculiar process of fermentation resulting in the formation of butyric acid. Some chalk is added to take up the B. A. whenever produced, and the better proportions to employ are 100 sugar, 8 to 10 fresh curd, and 50 chalk, with sufficient water to make a thin liquid. The butyrate of lime is left in the vessel, and on acting upon that by dilute hydrochloric or sulphuric acid, and redistilling, the free B. A. passes over in vapor, and is condensed. B. A. is a transparent, thin, oily liquid, with a most persistent rancid odor. It is mixable in all proportions in water, alcohol, ether, and oil of vitriol; has the specific gravity 973 (water being 1000), boils at 314°; though it volatilizes at ordinary temperatures, as appears from the rancid odor of its vapor. Its chemical symbol is $HO,C_8H_7O_3$, and it combines with bases, such as lime, soda, etc., to form salts.

BUTYRIC ETHER, or PINE-APPLE OIL, is an exceedingly fragrant oil obtained by distilling butyric acid (or the butyrate of lime), alcohol, and sulphuric acid. The material which passes over is the B. E., and it is generally mixed with alcohol, and sold in commerce as *artificial pine-apple oil.* It possesses the same very pleasant flavor which belongs to pine-apples, and there is little doubt that pine-apples owe their flavor to the presence of natural butyric ether. The artificial variety is now extensively used for flavoring confections, as pine-apple drops, for sophisticating bad rum, and for flavoring custards, ices, and creams, as also an acidulated drink or lemonade named pine-apple ale. B. E. alone cannot be used in perfumery for handkerchief use, as, when inhaled in even small quantity, it tends to cause irritation of the air-tubes of the lungs and intense headache, but it is employed as one material in the manufacture of compound perfumes.

It is composed of ordinary ether (C_4H_5O) and butyric acid ($C_8H_7O_3+HO$), and its strict chemical name and symbol is the butyrate of the oxide of ethyl ($C_4H_5O, C_8H_7O_3$). It is remarkable that a substance possessing such a disagreeable odor as butyric acid (that of rancid butter) should be capable of forming, in part at least, a substance with such a pleasant flavor as artificial pine-apple oil.

BUXAR', a t. of Shahabad, in Bahar, presidency of Bengal, situated on the right bank of the Ganges. It is chiefly remarkable as the scene of a victory gained in 1764 by sir Hector Munro. At the head of 7072 men, of whom only 857 were Europeans, he defeated a native army of 40,000, and captured 133 guns. B. is 62 m. n.e. of Benares, and 398 n.w. of Calcutta. Pop. '71, 13,446.

BUXBAU'MIA, a genus of mosses, of which only one species is known, *B. aphylla*, a very rare British plant, remarkable for its apparent want of leaves; the whole plant above ground seeming to consist of a little conical bulb, with minute scales, which are, however, really its leaves.

BUX'TON, a t. in Derbyshire, 33 m. n.w. of Derby. It lies 900 ft. above the sea, in a deep valley, surrounded by hills and moors, which have been tastefully planted; the only approach being by a narrow ravine, by which the Wye flows into the Derwent. The new part of the town is much under the level of the old. Five m. to the e. of B. is Chee Tor, a perpendicular limestone rock, rising to a height of between 300 and 400 ft. from the Wye. B. has, for 300 years, been famous for its calcareous springs, tepid (82° F.), and cold (discharging 120 gallons of water per minute), and its chalybeate springs. It is visited annually, from June to October, by 12,000 to 14,000 persons, the waters being taken for indigestion, gout, rheumatism, and nervous and cutaneous diseases. Nearly 5000 strangers can be accommodated at one time. There is an institution, called the Devonshire hospital, containing 100 beds, supported by subscription, where nearly 1000 patients are annually boarded and lodged free of charge. The baths and public walks are numerous. Much of the splendor of B. is due to the dukes of Devonshire, one of whom, in the last century, at the cost of £120,000, erected an immense three-storied pile of buildings of gritstone, called the Crescent, a curve of 200 ft., with wings of 58 feet. It includes several hotels, a library, assembly rooms, etc. Near B. is the Diamond hill, famous for its crystals; and Poole's hole, a stalactitic cavern 560 yards long. The Romans had baths here. Mary Queen of Scots resided for some time at B., when in the custody of the earl of Shrewsbury. B. is approached by railway both from n. and s.; and the baths, which were rebuilt some years ago, are considered among the finest in Europe. The town, which in 1881 had a population of 6021, is rapidly increasing. Four newspapers are published.

BUXTON, Jedidiah, an English prodigy of skill in numbers, b. 1704, and lived about 70 years. Though the son of a schoolmaster and grandson of a vicar, B.'s education was so neglected that he could not write, nor was he at an early period remarkable for knowledge of numbers. He never could tell how his singular power came, or how he used it; but it was observed that when "figuring" his attention was withdrawn from all external objects. He worked out every question by his own methods, without external aid, and without understanding the common rules of arithmetic. He would stride over a piece of land and tell the contents to almost exact measure. In this manner he measured the whole estate of Clinton, some thousands of acres, giving not only the acres but even the square inches. Then for his own amusement, he reduced the whole to square hair-breadths, on the base of 48 hairs to a lineal inch. His memory was such that he could stop in the midst of an abstruse calculation, and a week or even a month later resume it where he had left off. This mania for figures shut him out from all other knowledge, and on returning from church it did not appear that he had brought away a sentence that had been given out. His faculty was tested before the royal society, where he was presented with a gratuity. While in London he was taken to see Richard III., but his only enjoyment was in counting the number of words spoken by Garrick. He would easily count the steps of a company of dancers, but admitted that the sounds given out by a number of musical instruments perplexed him beyond measure.

BUXTON, Sir Thomas Fowell, a man of singular earnestness and force of character, belonging to the class termed "philanthropists," was b. in 1786 at Earl's Colne, Essex. The eldest son of a wealthy family, and early deprived of paternal guidance, his youth was distinguished chiefly by a strong development of animal energy, natural enough to a young Englishman whose full stature exceeded 6 ft. 4 inches. At the university of Dublin, his mind at length asserted its claims, and the new consciousness of needing to raise the family fortunes animated him to extraordinary efforts. His preparatory education had been almost thrown away, but at 21 he left the university its most distinguished graduate. In that year he married a sister of the celebrated Mrs. Fry, and entered business as a brewer, with an energy which in due time was crowned with splendid prosperity. His warm religious and moral impulses soon brought him prominently forward as an advocate of philanthropic interests. Prison discipline formed one of the earliest subjects of his efforts. In 1818, he entered parliament as member for Weymouth, which he continued to represent for about 20 years, taking a prominent part in

every debate on such questions as the amelioration of criminal law and of prison discipline, widow-burning and slave emancipation. The latter, in particular, engrossed a large share of his activity for many years, and no man on that side displayed more indomitable zeal and firmness in its advocacy. In 1837, he was rejected by his constituency, and refused ever after to stand for a borough. His philanthropic labors, however, terminated only with his life. In 1840, he received the well-merited distinction of a baronetcy. He died on 19th Feb., 1845. See *Memoirs of Sir T. Fowell B.* (1848).

BUXTORF, JOHANN, a celebrated orientalist, was b. 25th Dec., 1564, at Kamen, in Westphalia; studied at Marburg, Herborn, Basel, and Geneva. After traveling through Germany and Switzerland, he settled at Basel, where he became professor of Hebrew in 1591. He died of the plague, 13th Sept., 1629. In a knowledge of rabbinical literature, he surpassed all his contemporaries. The two works which prove his extensive acquaintance with this recondite branch of theological study, are his *Biblia Hebraica Rabbinica* (Basel, 1618–19), and his *Tiberias seu Commentarius Masorethicus* (Basel, 1620). The most useful of his grammatical works is the *Lexicon Hebraicum et Chaldaicum* (Basel, 1607).

BUXTORF, JOHANN, the son of the former, was b. at Basel, 13th Aug., 1599, and displayed at an early period a decided predilection for the same studies with his father. At five years of age—according to his rather credulous biographers—he could read German, Latin, and Hebrew. To perfect his knowledge of these tongues, he visited Holland. France, and Germany; and in 1630 was appointed to succeed his father in the chair of Hebrew at Basel, where he died 16th Aug., 1664. Besides his *Lexicon Chaldaicum et Syriacum* (Basel, 1622), and a work of Maimonides, entitled *More Nevochim* (Basel, 1629), which is an exposition of obscure passages of the Old Testament, he published from the MSS. of his father a *Lexicon Chaldaicum, Talmudicum, et Rabbinicum* (Basel, 1639), and *Concordantiæ Bibliorum Hebraicorum* (Basel, 1632).

BUX'US. See BOX.

BUYING OF PLEAS by lawyers is prohibited by an old Scotch act passed in 1594. It is explained under the English term *champarty*, to which it is analogous.

BUYUKDEREH, a beautiful suburb of Constantinople, from which it is a few miles distant, situated on the Bosporus, in the midst of the most charming scenery. It forms the summer residence of many of the Christian ambassadors, some of whom have splendid mansions here.

BUZZARD, *Buteo*, a genus of *accipitres* (q.v.), or birds of prey, of the family *falconidæ*, having a rather small and weak bill, which bends from the base, and is not notched, as in falcons. The legs are short and strong, the tarsi covered with scales or with feathers, the toes short, and the claws strong. Buzzards may be regarded as an inferior kind of eagles; they do not possess courage equal to that of eagles and falcons, nor equal strength of bill or claws. They are large birds: the common B. (*B. vulgaris*) measuring almost 4 ft. from tip to tip of its outstretched wings. It is a bird still pretty common in Britain, although much less so than it formerly was. It is subject to variations of plumage; the prevailing color is brown, with a considerable mixture of black on the upper parts, and of white or grayish-white on the under. It is sluggish and inactive, in comparison with many other birds of the same family; is usually slow in its flight, and often sits long on a tree, watching for prey, which, when it perceives, it glides silently into the air, and sweeping rapidly down, seizes it in its claws. This B. is plentiful in all the wooded parts of Europe; it is found also in the n. of Africa, and is known to exist in the western parts of Asia; but it is doubtful how far it extends over that continent, a distinct although very similar species occurring in the Himalaya mountains. The common B. is, however, a North American bird. Tame female buzzards have been known in several instances to exhibit so strong a propensity for incubation, and the rearing of young, at the proper season, that they have hatched hens' eggs and brought up the chickens, although if chickens not of their own hatching were brought within their reach, they devoured them. Meat given to the B. nurse was carefully divided among her nurslings, but they found out by their own instincts the use of grain and other vegetable food.—The rough-legged B. (*B. lagopus*) is very similar to the common B., but is at once distinguished by having the tarsi feathered to the toes, whilst in the common B. they are covered with scales. It is a rarer British bird, yet not of unfrequent occurrence; it is very widely diffused, being found in the old world from Lapland to the cape of Good Hope, and equally common in North America. It is most frequently to be seen in marshy districts, and often skimming over marshes, where it makes prey of frogs.—The red-tailed hawk of North America is a species of B. (*buteo borealis*). It is in very bad repute among American farmers and housewives for its frequent invasion of poultry-yards, from which it has acquired the name of *hen-hawk*.—Several other species of B. appear to be limited to particular parts of the world, as *buteo jackal*—so called from the resemblance of its voice to that of the jackal—to s. Africa, and *B. melanosternon* to Australia. The Australian species has the head, chest, and center of the belly deep black. The honey-buzzards (q.v.) belong to a different genus, although nearly allied to the true buzzards, as are also the harriers (q.v.), of which the most common British species, the marsh harrier, is sometimes called the *moor buzzard*.—Bald B. is the name of the osprey (q.v.).

BUZZARD'S BAY, on the s. coast of Massachusetts, about 30 m. long by 7 wide; sheltered from the ocean by the Elizabeth islands and Vineyard sound. In the bay are the harbors of New Bedford, Wareham, Sippican, Fairhaven, and Mattapoiset.

BY-BIDDING, at auctions where the bidder may be employed by the owner, and really bidding to enhance the price, not meaning to purchase. This form is unlawful; but bidding merely to prevent the sale of property below its actual value is not so considered.

BYBLOS, an ancient city of Phenicia, now called Jubeïl, situated at the base of the lower range of the Libanus, about half-way between Tripoli and Beyrout. B. was famous as the birthplace of Adonis, or Thammuz, in whose honor a splendid temple was erected, which attracted many worshipers. The name given to the town by the Jews was Giblah, and its inhabitants the Giblites are noticed in the Scriptures as stone-squarers and caulkers of ships. A wall belonging, apparently, to the era of the crusades, surrounds the town, and the remains of a Roman theater are still visible.—B. was also the name of a town in the Egyptian delta, celebrated for its manufacture of papyrus from the byblus or papyrus plant.

BY-LAWS are the private regulations which are usually made by corporate bodies for the control and government of the corporation. They are binding, unless contrary to the laws of the land, or to the charter, or act of incorporation, or, as it has been decided in England, unless they are manifestly unreasonable. Blackstone tells us that the right of making by-laws was allowed by the law of the twelve tables at Rome; and Mr. Stephen, in his *Commentaries*, states that in the law of England such a right is so much of course, as regards every corporation, that if the charter by which certain persons are incorporated give to a select body, out of their whole number, a power to make by-laws as to certain specified matters, the body at large is nevertheless at liberty to make them with regard to all matters not specified. Every corporation, too, can of course alter or repeal the by-laws which itself has made. By the municipal corporation act, 5 and 6 Will. IV. c. 76, s. 90, borough councils have power to make by-laws for the government of the borough, and for the prevention and suppression of nuisances; such by-laws, however, not to be of force till the expiration of forty days after the same, or a copy shall have been sent to one of the secretaries of state, during which period her majesty, with the advice of her privy council, may either disallow the by-laws, or a part, or enlarge the time within which they shall not come into force. Railway companies are required to lay before the board of trade, for the approbation of that authority, certified copies of the by-laws and regulations by which the railway is governed, which by-laws may be disallowed by the board at its pleasure. See CANAL, CARRIER, RAILWAY.

BYLES, MATHER, D.D.; 1706–88; graduated at Harvard, and ordained minister of the Hollis street church, Boston, in 1733. In 1765, he was given the degree of doctor of divinity by the university of Aberdeen. He was a correspondent of Swift and Pope, and published a volume of his own poems. During the revolution he adhered to the English side, and for that reason his connection with his parish was dissolved. In 1777, he was denounced as an enemy to the country, imprisoned for a time, and condemned to exile, but the latter sentence was commuted to confinement in his own house, before which sentinels were placed. His reputation for quick and caustic wit has kept his memory alive.

BYNG, GEORGE, Viscount TORRINGTON, a British admiral, b. Jan. 27, 1663, eldest son of John Byng, esq., of Wrotham, Kent, entered the navy as a volunteer at the age of 15, and rapidly rose to the rank of lieut. In 1688, he recommended himself to the prince of Orange by his activity and zeal in attaching the officers of the fleet to the cause of the revolution, and was advanced to the rank of capt. In 1702, he took part in the capturing and burning of the Spanish fleet at Vigo, and in the following year was made rear-admiral of the red. The attack on Gibraltar was solely confided to his command, and for his gallant conduct at the battle of Malaga he was knighted by queen Anne. In 1708, he became admiral of the blue, and commanded a squadron fitted out to oppose an intended invasion of Scotland from France, on the part of the pretender. He pursued the French fleet to the firth of Forth, took one ship, and forced the fleet back to Dunkirk, on which occasion he was presented with the freedom of the city of Edinburgh. On the breaking out of the rebellion of 1715, he was appointed to the command of a squadron in the Downs, and for important services against the French, was created a baronet. In 1718, he commanded the English fleet sent to Sicily for the protection of the neutrality of Italy, and gained a victory over the Spanish fleet off Messina. Soon after, he was appointed treasurer of the navy, and rear-admiral of Great Britain. In Jan., 1721, he was sworn one of the privy council, and in Sept. following, created baron Southhill and viscount Torrington. On the revival of the order of the bath, in 1725, he was installed one of the knights; and, on the accession of George II., was nominated first lord of the admiralty. He represented Plymouth in parliament from 1706 until 1721. Died Jan. 17, 1733.

BYNG, JOHN, a brave but ill-fated British admiral, fourth son of the preceding, b. in 1704, entered the navy early, served under his father, and, in 1727, became capt. In 1748, he had attained the rank of admiral of the red. In 1756, he was appointed to com-

mand a squadron of ten ships of the line in the Mediterrancan, destincd for the relief of Minorca, at that time blockaced by a French fleet under La Galissoniere. On the 20th May, B. made thc signal to engage, which was obeyed by rear-admiral West with such impetuosity that several of the enemy's ships were driven out of the line; but B. not advancing to his support, the French were allowed to escape, and Minorca was lost The dissatisfaction in England, on the news arriving, was taken advantage of by the ministry to avert the public odium from their own inefficicnt measures. B. was tried by a court-martial, and condemned to death, for a breach of the 12th article of war, but recommended to mercy. Sacrificed to the general indignation, he was shot on board the *Monarch*, at Portsmouth, Mar. 14, 1757, meeting his fate with firmness and resignation. In the fleet, he was not popular, being a strict disciplinarian.

BYNKERSHOEK, Cornelius van, a Dutch jurisconsult, was b. at Middelburg, in Zealand, 29th May, 1673. He studied at the university of Franeker, took the degree of doctor in 1694, and immediately after commenced to practice as an advocate of the Hague. In 1703, he was elected by the states-general a member of the supreme court, and, in the exercise of his functions, soon had occasion to observe how defective and vague was the common law of the country. In 1710, with a view to remedy this, he published the first part of his *Observationes Juris Romani;* in 1719, his *Opuscula Varii Argumenti;* and in 1724, he was elevated to the dignity of president of the supreme court. In 1733, appeared the rest of his *Observationes Juris Romani.* B. now began to devote himself earnestly to the study of Dutch and international law, acquiring, of the former in particular, a most extensive and solid knowledge. His great work on this subject is his *Quæstiones Juris Privati*, which he did not live to finish, and on the other, his *Questiones Juris Publici.* In addition to these, B. collected (from his notes) the decisions and proceedings of the supreme court in his time, under the title *Observationes Tumultuariæ*, and besides (what is perhaps his most valuable work) made a digest under the title of *Corpus Juris Hollandici et Zelandici*, of all thc laws of his own country, whether statutory, or existing in the decisions of courts, or in the practicc of the bar, or in the customs of particular places. He died 16th April, 1743. A complete edition of his works was published by prof. Vicat, of Geneva, in 1761.

BYRAM RIVER, a small stream, scarcely more than a brook, which is often mentioned as the farthest western boundary of New England, separating thc towns of Greenwich, Conn., and Rye, N. Y. Recent surveys have straightened the boundary line, which, however, still begins at the mouth of the river and follows it a short distance. One mile above its entrance into Long Island sound, the stream widens, receives the tide, and is navigable for the smaller class of vessels to the village of Port Chester.

BYRD, William, 1674–1744; b. Va., and educated in England, where he became a fellow of the royal society. Returning to America, he was receiver-gcneral of revenue in Virginia, colonial agent, membcr of the council, and one of the commissioners to fix the North Carolina boundary. He laid out the citics of Richmond and Petcrsburg in 1733 on his own land.

BYRGIUS, Justus, or, more properly, Jobst Bürgi, the inventor of various astronomical instruments, was b. 28th Feb., 1552, at Lichtensteig, in the canton of St. Gall, Switzerland. In 1759, he went into the service of the learned landgraf of Hesse, Wilhelm IV. His first work was a celestial globe, ths surface of which was plated with silver, and in which the stars were placed according to his own observations. The landgraf sent it to the emperor Rudolf II., who thought it sc beautiful that, in 1604, he appointed B. his own mechanician. B. subsequently went to Austria, but returned to Cassel in 1622, where he died in 1633. Many of his reputed discoveries and inventions are questioned, such as those of logarithms and the proportional compasses; but he seems to have hit upon something like both, while it is certain that he was the inventor of a method of resolving spherical triangles.

BYRLAW, Birlaw, or Burlaw, thc name given to a sort of popular jurisprudence formerly in use in Scotland, in villages and among husbandmen. Sir John Skene, writing in 1597, when the system was in full force, defines B. as "*leges rusticorum, de re rustica latæ*—laws made by husbandmen, concerning neighborhood to be kept among themselves."—*Reg. Majest.* lib. iv. c. 39; *De Verb. Signif.* voce Byrlaw. As the B. was enacted by the common consent of the villagcrs or neighbors, so it was administercd by judges chosen by them from their own ranks. These judges were commonly called "byrlaw men," a name which is still applied in some parts of Scotland to an arbiter, oddsman, or umpire. The courts which they held were called "byrlaw courts," and took cognizance of disputes betwecn neighbor and neighbor. B. is supposed to be derived from *boor*, or *baur*, a countryman.

BYROM, John, 1691–1763; an English poet and miscellaneous writer. *Colin and Phoebe*, his first poetical essay, appeared in the *Spectator.* He was made a member of the royal socicty; invented and taught a system of short-hand writing; was a person of lively wit, and had a taste for the mystical theology of Böhme.

BYRON, Anne Isabella Milbanke, 1792–1860; only child of sir Ralph Milbanke, and wife of lord Byron. She married lord Byron Jan. 2, 1815, and separated from him in Feb. of the next year. On the death of lord (properly baron) Scarsdale, she became

baroness of Wentworth, and for several years before her death employed her large income in works of charity. One child was borne by her to Byron, "Ada, sole daughter of my house and heart," who married William, lord King, afterwards earl of Lovelace.

BYRON, GEORGE GORDON, Lord, a great English poet, was b. in Holles street, London, on the 22d of Jan., 1788. He was the only son of capt. John Byron, of the guards, and Catherine Gordon of Gight, an heiress in Aberdeenshire. Capt. Byron and his wife did not live happily. Domestic peace perished in the conflict of their ungovernable tempers. The husband's habits were profligate in the highest degree, and the wife's fortune was soon squandered in the debauch and at the gambling-table. Separated from her husband, the lady retired to the city of Aberdeen with her little lame boy, whom she passionately loved, her sole income at this time being about £130 per annum. In his 11th year, B. succeeded his grand-uncle, William lord Byron; and mother and son immediately left the north for Newstead abbey, the ancient seat of the family, situated a few miles distant from Nottingham, in the romantic district which Sherwood forest shadowed, and which was once familiar with the bugle of Robin Hood. On succeeding to the title, B. was placed in a private school at Dulwich, and thereafter sent to Harrow. The most remarkable thing about B.'s early years was his extraordinary attachments. Like almost every member of the poetic tribe, he "had a passion for the name of Mary." In his 8th year, in Aberdeenshire, he fell in love with Mary Duff. Margaret Parker, a cousin of his own, and who died early, was his next idol. His strongest passion was, however, for Mary Chaworth. This lady he first met when on a visit to Newstead in 1803, at which date he was in his 15th year. Miss Chaworth's father had been killed in a duel by lord Byron, the grand-uncle of the poet, and marriage would have healed the family feud, and would have joined rich estates. But it was not to be. Miss Chaworth was B.'s senior by two years, and evidently felt little flattered by the worship of the lame Harrow boy. Next year came the parting interview described in *The Dream*, with which every Englishman is familiar now as with a personal experience. In 1805, B. removed to Trinity college, Cambridge; and two years thereafter, his first volumn of verse, entitled *Hours of Idleness*, was printed at Newark. The poems therein contained were not absolutely without merit, but they might have been written by any well-educated lad who, in addition to ordinary ability, possessed the slightest touch of poetic sensibility. The volume was fiercely assailed by lord (then Mr.) Brougham in the *Edinburgh Review*, and his sarcasms stung B. into a poet. The satire, *English Bards and Scotch Reviewers*, was written in reply to the article in the *Edinburgh*, and the town was taken by a play of wit and a mastery of versification unequaled since the days of Pope. In the babble of praise that immediately arose, B. withdrew from England, visited the shores of the Mediterranean, and sojourned in Turkey and Greece. On his return in 1812, he published the first two cantos of *Childe Harold*, with immense success, and was at once enrolled among the great poets of his country. During the next two years, he produced *The Giaour; The Bride of Abydos; The Corsair;* and *Lara*. While these brilliant pieces were flowing from his pen, he was indulging in all the revelries and excesses of the metropolis. What was noblest in the man revolted at this mode of life, and, in an effort to escape from it, he married Miss Milbanke, daughter of sir Ralph Milbanke, a baronet in the co. of Durham. This union proved singularly infelicitous. It lasted only a year, and during that brief period, money embarrassments, recriminations, and all the miseries incident to an ill-assorted marriage, were of frequent occurrence. After the birth of her child Ada, lady Byron retired to her father's house, and refused to return. This event, from the celebrity of one of the parties, caused considerable excitement in the fashionable world. B. became the subject of all uncharitable tongues. The most popular poet, he was for a space the most unpopular individual in the country. In one of his letters, written from Italy some years later, referring to the slanders current at the time, he thus expresses himself: "I was accused of every monstrous vice by public rumor and private rancor. My name, which had been a knightly or a noble one since my fathers helped to conquer the kingdom for William the Norman, was tainted. I felt that if what was whispered, and muttered, and murmured was true, I was unfit for England; if false, England was unfit for me. I withdrew." The separation from his wife, and the departure from England, mark a stage in B.'s genius. A new element of power had entered into his verse; the reader feels it quite distinctly in the magnificent burst of exultation that opens the third canto of the *Childe*—

> Once more upon the waters, yet once more!

Misery and indignation stimulated him to remarkable activity. Six months' stay at Geneva produced the third canto of *Childe Harold* and *The Prisoner of Chillon*. *Manfred* and *The Lament of Tasso* were written in 1817. The next year, he was at Venice, and finished *Childe Harold* there; and, in the gay and witty *Beppo*, made an experiment in the new field which he was afterwards to work so successfully. During the next three years, he produced the first five cantos of *Don Juan*, and a number of dramas of various merit, *Cain* and *Werner* being opposite poles. In 1822, he removed to Pisa, and worked there at *Don Juan*, which poem, with the exception of *The Vision of Judgment*, occupied his pen almost up to the close of his life. Morally, his Italian life was unsatisfactory, and his genius was tainted by his indulgences. At the close of his career, he was visited

by a new inspiration; the sun, so long obscured, shone out gloriously at its setting. In the summer of 1823, he sailed for Greece, to aid the struggle for independence with his influence and money. He arrived at Missolonghi on the 4th of Jan., 1824. There he found nothing but confusion and contending chiefs; but in three months, he succeeded in evoking some kind of order from the turbulent patriotic chaos. His health, however, began to fail. On the 9th of April, he was overtaken by a shower while on horseback, and fever and rheumatism followed. Medical aid was procured, and copious bleeding recommended; but this, B., with characteristic willfulness, opposed. Before death, he sank into a state of lethargy, and those who were near heard him murmuring about his wife, his sister, and his child. After twenty-four hours' insensibility, he expired on the evening of the 19th April, 1824. His body was conveyed to England; and, denied a resting-place in Westminster abbey, it rests in the family vault in the village church of Hucknall, near Newstead.

Lord B. is a remarkable instance of the fluctuations of literary fashion. Elevated to the highest pinnacle of fame in the heyday of his early popularity, he was unduly depressed after his death, when the false romance which he threw around himself and his writings began to wear away; and it is only during the last twenty or thirty years that the proper place has been found for him in the public estimation. He is high, but not the highest. The resources of his intellect were amazing. He gained his first reputation as a depicter of the gloomy and stormful passions. After he wrote *Beppo*, he was surprised to find that he was a humorist; when he reached Greece, he discovered an ability for military organization. When all the school-girls of England fancied their handsome idol with a scowling brow and a curled lip, he was laughing in Italy, and declaring himself to be the most unromantic being in the world. And he was right. Take away all his oriental wrappings, and you discover an honest Englishman, who, above all things, hates cant and humbug. In *Don Juan* and his *Letters* there is a wonderful fund of wit, sarcasm, humor, and knowledge of man. Few men had a clearer eye for fact and reality. His eloquence, pathos, and despair; his *Manfreds* and *Childe Harolds*, were only phases of his mind. Toward the close of his life, he was working toward his real strength, and that lay in wit and the direct representation of human life. If his years had been extended, he would in all likelihood have deserted poetry for prose, gaudy colored fiction for sober fact; and the assertion may be hazarded, that the English novel would have boasted of another and a greater Fielding.

BYRON, Henry James, b. Manchester, England; died 1884; author of many dramatic works, chiefly in burlesque, that have won popular favor. Among them are *Fra Diavolo; Maid and Magpie; Babes in the Wood;* and travesties of many of the more popular operas. Of comedies he has written *War to the Knife; A Hundred Thousand Pounds; Not Such a Fool as he Looks* (in which he played the hero); *An American Lady; Old Sailors;* and *Our Boys*, the last comedy achieving an almost unexampled success.

BYRON, Hon. John, 1723–86; an English admiral and circumnavigator. He was the grandfather of Byron the poet. While young, he accompanied Anson around the world, and in later years experienced so much hard service that he was nicknamed by sailors "Foul-weather Jack." In 1769, he was a governor of Newfoundland, and in 1776 became vice-admiral. In 1778, he was sent with a fleet to watch the movements of count d'Estaing, who had gone to the assistance of the American colonies then in revolution; and in July of the next year, fought the count off Grenada, but the action was of little importance.

BYRON BAY lies on the n.e. coast of Labrador in North America, its lat. and long. being respectively 54° 40′ n., and 57° 30′ w.

BYRON ISLAND is situated in the Mulgrave archipelago of the Pacific ocean, its lat. and long. being respectively 1° 18′ s., and 177° 20′ east.

BYS'SUS, a name given from ancient Greek and Roman times to the bundle of silky filaments by which many lamellibranchiate mollusks—bivalve shells—attach themselves to rocks or other fixed substances. The B. springs from a cavity at the base of the solitary foot of the mollusk, and its filaments, which are capable of being reproduced if destroyed, are secreted by a glandular tissue which occupies a furrow running nearly to the extremity of the foot. They are united together at the base in a common mass, and are often considerably divergent. They are guided to their place by the foot, and expand into a sort of disk at the point of attachment, so as to have a firm hold. A few common mussels in an aquarium readily afford an opportunity of observing the B., particularly when the filaments are attached to the glass sides of the vessel. In the *pinna* (q.v.) of the Mediterranean, the B. is remarkably long and delicate, has a beautiful silky lustre, is very strong, and is capable of being woven into cloth, upon which a very high value is set; but the animal which produces it is now so rare, that it is almost exclusively an article of curiosity. This manufacture was known to the ancients.

BYS'SUS (Gr., a fine flaxen or silky substance), a genus established by Linnæus to include some of the lowest and most obscure forms of vegetation, and defined as having a substance like fine down or velvet, simple or feathered. Botanists sometimes ranked it among *algæ*, sometimes among *fungi;* it has been made the type of a group *byssaceæ*, and placed among lichens. Some have regarded this group as entitled to the rank of

a distinct order, "comprehending the filamentous fungi found in cellars, and similar plants;" but others reject the genus as altogether spurious. Some of the species once included in it have now been satisfactorily shown to be lichens, others to be *confervaceæ*, whilst many appear to be really not distinct vegetable forms, but cryptogamic plants prevented by unfavorable circumstances from proper development. The green incrustations formerly regarded as species of B., have been found to be the primary germination of mosses, often species of *polytrichum* and *tortula*. It cannot be said, however, that the nature of all the vegetable forms which have been referred to the genus B., has yet been satisfactorily ascertained. Some of them are very phosphorescent, and are generally found where some higher form of vegetation is undergoing decay.

BYSTRÖM, Joh. Nikolaus, a celebrated sculptor, was b. 18th Dec., 1783, at Philippstadt, in the province of Wermeland, Sweden, and educated under Sergell of Stockholm. In 1809, he obtained the highest prize in the Swedish academy of arts, and in the following year went to Rome, where he executed his first independent work, a "Drunken Bacchante," and sent it home. It was received with great approbation, and B. had to repeat it thrice. In 1815, he returned to Stockholm, and surprised the newly elected crown-prince by exhibiting a colossal statue of himself, which he had finished all but the head in Rome, and had found means to complete quietly in Stockholm. The crown-prince was highly gratified, and commissioned B. to execute colossal statues of Charles X., XI., and XII. After 1838, he resided in Stockholm; but returned to Rome in 1844, and died there Mar. 13, 1848. His chief works are: "A Nymph going into the Bath," "A reclining Juno suckling the Young Hercules," "Hygieia," "A Pandora combing her Hair," "A Dancing-girl," a statue of Linnæus, and colossal statues of Charles XIII., Gustavus Adolphus, and Charles XIV. B. excels in the delineation of females and children, but his male figures want strength of character; his conceptions are always true to nature, his grouping skillful and pleasant, and his execution is clear and distinct.

BYTTNERIACEÆ, a natural order of exogenous plants, sometimes united with the order *sterculiaceæ* (q.v.), and also closely allied to *malvaceæ* (q.v.), from which it differs, especially in the stamens not being columnar—although more or less united, generally into a cup or tube—also in the anthers being turned inwards, and 2-celled. The species of this order are trees, shrubs, or half-shrubby plants, abounding chiefly in tropical climates, although some are natives of the temperate zones. About 400 have been described. The flowers of many are beautiful. The most important product of the order is Cocoa (q.v.). The fruit of *guazuma ulmifolia*, a native of Brazil, is eaten, being filled with a sweet and pleasant mucilage. The young bark of this tree yields, when macerated, a copious mucilage, and is therefore used in Martinique for clarifying sugar, as is that of *kydia calycina* in the northern provinces of India. *Guazuma ulmifolia* was introduced into India, and at one time largely cultivated in the Madras presidency, under the name of bastard cedar, that its foliage and young shoots might be employed as fodder for cattle. Its straight, luxuriant young branches yield a strong fiber. The bark of other species of this order also affords a tough fiber, which is employed for making cordage, particularly that of *microlæna* (or *schillera*) *spectabilis* in the regions on the southern base of the Himalaya, *abroma augustum* in various parts of India, *dombeya spectabilis* in Madagascar, and *D. umbellata* in the isle of Bourbon. *Abroma augustum* has been especially recommended to attention and cultivation on account of its fiber, which is beautiful, white, fine, and strong, and is produced in great abundance. The plant grows to be a handsome small tree, having hairy lobed leaves and beautiful drooping purple flowers; but may be treated much as willows grown for basket-making, and in this way yields two, three, or even four crops of cuttings annually, which are peeled and the bark macerated in order to the separation of the fiber.

BY-TOWN, a t. of Upper Canada, on the Ottawa, which took its name from col. By of the royal engineers. It is now *Ottawa* (q.v.), the capital of the dominion of Canada.

BYZAN'TINE ART. From the time of Constantine the great, the emperors of the east arrogated to their imperial city the pre-eminence which, for so long a period, ancient Rome had actually possessed; and, as a necessary consequence of this assumption, Constantinople, or Byzantium, as it still continued sometimes to be called, became the rival of the mother-city in the richness and variety of its artistic monuments. In Rome, and, indeed, in the whole of western Europe, the first effect produced by the influx of the mighty stream of barbarian life, and the consequent dissolution of existing society, was the almost total suppression of artistic effort. It was then that the artists of the west, willing and eager to avail themselves of the invitation held out to them, poured into Constantinople, carrying with them what yet remained of the artistic life of the ancient world. Byzantium was the hearth on which, during the dark period of the middle ages, those feeble sparks of ancient art were kept alive, which served to kindle the new and independent artistic life of the modera world. Not only were the painters and sculptors of Italy indebted to the art of Byzantium for the tradition of that ideal mode of conception to which the term classical is peculiarly applied, but artists in every department derived thence the elements of that technical knowledge without which the embodiment of such conceptions is impossible. This practical acquaintance with the technical rudiments of their respective arts, which could scarcely have been derived from a mere examination of ancient works, was communicated to the fathers of Italian.

art by living Byzantines, some of them probably the descendants of those whom barbarian conquests had driven into the east, and whom the conquests of a still more barbarous race now restored to western Europe. It is impossible to doubt that modern art was largely indebted to this circumstance for the marvelous stride which it took immediately after the taking of Constantinople by the Turks. But though its chief value may consist in its having thus transmitted to us the succession of antiquity, B. A. was by no means devoid of original and individual character; and it is only in so far as it possesses this, and not when regarded as a mere conservation of antique types and processes, that it takes rank as a school of art. The characteristic element in B. A. may be described as the earliest artistic recognition and representation to the senses of what was new and peculiar in Christian as opposed to heathen life. To the fullest extent to which it could claim a separate and individual existence, B. A. was Christian art; and consequently in Germany, where the subject has received more attention than in this country, the two terms are frequently used as synonymous. The appearance of B. A., in this its only peculiar sense, dates from the age of Justinian, i.e., from the earlier half of the 6th c., and its productive period may be said to terminate with the conquest of the eastern empire by the crusaders in 1204. But though its declension dates from this event, B. A. continued to exist in considerable vigor down to the final destruction of the empire of the east, in 1453; and even now may be seen as the inseparable handmaid of the Greek church, both in Europe and in Asia. It is in this point of view, and more particularly as forming the basis of artistic life in Russia, that B. A. possesses its chief living interest in our day. What Rome was to the western, Byzantium was to the eastern European; and the relation of the latter to his mother-city, if it commenced at a somewhat later date, continued during the whole period of the middle ages.

Though the inhabitants of eastern Europe thus derived their traditions of antiquity from a meaner source than the Romanic nations, they received them more unbroken; and, from first to last, were subjected to their influences during a much longer period. To them the living voice and hand continued to communicate what for nearly a thousand years Italians, Spaniards, and Franks had had to seek in the dead image and letter alone; and if anything still remains unrecorded of ancient thought, it doubtless dwells on Greek, and not on Roman or German tongues. Indolent, luxurious, and dissolute as their ancestors had been in classical times, the citizens of Constantinople were distinguished by an intellectual character, which, unfruitful and enfeebled though it was, was systematic, subtle, mystical, and pedantic. They were eminently an instructed people; but, like individuals whose glory is in the past, they were more conservative than original; and, however justly we may despise the chaff which they engendered, it is impossible to overestimate the value of the corns of gold which clung to their memories.

Byzantine Architecture. The typical form of B. A., at least as applied to ecclesiastical purposes, was fixed by the church of St. Sophia, which still exists as the great mosque of Constantinople. It was built, or rather rebuilt, by the orders of Justinian, the architects being Anthemius of Tralles, and Isodorus, the elder, of Miletus, and completed 537 A.D. Though the largest and most magnificent, the church of St. Sophia was but one of 25 churches which were erected in the capital, and of a vastly greater number of ecclesiastical structures with which the provinces were adorned by the pious emperor. The style thus introduced largely influenced the architecture even of western Europe; and in St. Mark's at Venice, the churches at Ravenna and elsewhere on the Adriatic, and even in the cathedral of Aix-la-Chapelle, we have examples of churches almost purely Byzantine. The fundamental principle in the construction of Byzantine churches was an endlessly varied application of the Roman arch, whilst its exhibition in the form of the cupola was their most characteristic feature. In the St. Sophia, as was generally the case, the cupola covered the principal central portion of the church, and was supported by strong and lofty pillars, bound together by bold arches. To this central space were usually joined others of smaller size, which were covered by half-cupolas or arches of more ordinary construction. Though frequently in the form of a Greek cross, with the great cupola rising in the center, and smaller or semi-cupolas surmounting the four arms, neither this nor any other plan was consistently adhered to in Byzantine churches. The windows were always semicircular, similar to those in the Romanic churches of Germany, and in our own Saxon or early Norman churches; but the doors were frequently square-headed, after the classical model. Many of the details, such as the square capitals tapering downwards, and the bold projecting moldings ornamented with foliage, seem to have owed their origin entirely to the ingenuity of Byzantine architects. The earlier Byzantine churches were profusely ornamented with mosaics, which, after the admixture of the Gothic element, and the adoption of the pointed arch, gave place to fresco-paintings. The constant use of the apse (q.v.) is, after the cupola, perhaps their most marked feature. The following division into periods, though, like most divisions of the kind, somewhat arbitrary, has the authority of M. Couchaud, an eminent French architect, in its favor, and is, apparently, adopted by Parker: 1. From the time of Constantine to the middle of the 6th c.; 2. From the beginning of Justinian's reign down to the 11th c., which comprises the greater part of the existing buildings of the pure Byzantine type; 3. From the 11th c. to the conquest of Greece by the Turks,

when the influence of the Venetian conquests is apparent in the intermixture of Italian and Gothic details and characteristics.

Byzantine Sculpture. When contrasted with the ignoble, tasteless, and meaningless productions of the later plastic art of Rome, that of Constantinople claims both admiration and respect. The figures are not deficient in dignity either in form or in attitude, and a deeply Christian spirit is traceable both in their general conception, and in their rich and significant symbolical accompaniments. In sculpture, as in architecture, the peculiar Byzantine type first exhibits itself towards the beginning of the 6th century. Alongside of unmistakable reminiscences of the antique, it exhibits characteristics which are as unquestionably oriental. The figures are positively laden, not with drapery alone, but with costume, which obscures the nobler and freer lines in which the ancients delighted. The execution is careful, even painful. All this becomes more and more the case as we advance in the order of time, the earliest Christian works, and those immediately suggested by the antique, exhibiting such faults only to a limited extent. Down to the 12th c., the defects which we have described were the worst which could be laid to the charge of B. sculpture, and it is scarcely earlier than the 13th c. that it assumes that mummy-like aspect by which it is too generally known. The art of carving in ivory was practiced with great success at Constantinople, and in the examples of it which remain, the gradual decline—the *benumbing process*, as it has been aptly called—may be traced with great distinctness. Of this species of work, in its earlier and better time, a fine specimen in alto-rilievo of the "forty saints" may be seen in the museum at Berlin. The decorations of the churches, and of the sacred vessels used in the service of the altar, formed no insignificant objects of art in the better Byzantine period. Cups, plates, lamps, candlesticks, crosses, and the like, were either of gold or silver, and frequently adorned with jewels; whilst the altar itself, the chancel, and sometimes the whole interior of the church, were covered with precious metals, the panels being adorned with mosaics or frescos.

Byzantine Painting. The same characteristics which we have ascribed to the sculpture belonged to the pictoriale fforts of the artists of Byzantium, and of the neighboring countries who were mostly their imitators. The execution was careful and anxious rather than skillful, and such skill as still remained was exhibited in the mechanical perfection with which the gilding of the backgrounds and other details were managed. Of B. pictures, the best existing specimens are to be found in Italy, and belong especially to the school of Sienna. The picture of the Virgin in the church of St. Domenico at Sienna by Guido, bearing date 1221, deserves special mention. Much labor was expended on the illumination of MSS. of the Scriptures, and of these many beautiful examples, as fresh as when they were painted, may be seen in most of the larger public libraries of Europe. The chief interest attaching to B painting consists in the parental relation in which it stood to the art of Italy. Cimabue may be regarded as its immediate heir; and in the works of Giotto, Leonardo da Vinci, Pietro Perugino, and even of Raphael in his earlier time, the traces of the inheritance are quite unmistakable. See Painting.

Byzan'tine Empire, also styled the East Roman, Eastern, or Greek Empire, was founded in 395 A.D., when Theodosius the great, at his death, divided the Roman empire between his two sons, Arcadius and Honorius. The former, a weak and luxurious character, was made emperor of the eastern division, formerly included under the prefectures of the east and of Illyricum—namely, Syria, Asia Minor, and Pontus, stretching along the shores of the Black sea in Asia; Egypt in Africa; and Thrace, Mœsia (now Bulgaria), Macedonia, Greece, and Crete in Europe. Arcadius left the government of the empire in the hands of his minister, Rufinus, from whom it passed to the eunuch Eutropius, and afterwards to Gainas, the murderer of Rufinus. Gainas fell by his ambition in 401, and the shameless and avaricious empress Eudoxia ruled until the time of her death, 404. See Arcadius. After Theodosius II., a minor, under the guidance of the prefect Prætorio Anthemius, had held the reins during six years, he resigned the government in favor of his sister Pulcheria (Augusta), who ruled powerfully while her brother was kept apart from all state affairs. Western Illyria (comprehending Pannonia, Dalmatia, and Noricum) was ceded to the Eastern empire by the Roman emperor, Valentinian III.; and after several victories achieved by the Byzantine general, Ardaburius, over the Persians, a part of Armenia was also annexed. But, nevertheless, Thrace and Macedonia could only be secured from the destructive conquests of Attila by the payment of tribute. After the death of Theodosius II., Pulcheria married the senator Marcianus (450–57), whose firmness repelled the invasions of Attila. Marcianus was followed by Leo I., surnamed Macella (the butcher), a Thracian of low birth, but elevated to the throne by the commander-in-chief, Aspar, who, being himself an Arian, would not venture to encounter the perils that sovereignty might have entailed on one of his religious views. Leo II., grandson of the former, succeeded, but died after a few months, in consequence of which the crown came into the possession of his father, Zeno (474–91), who was banished by Basiliscus (475), but who re-ascended the throne in 477. Though a weak and unpopular ruler, he contrived to retain his power in spite of several serious revolts. The internal distraction of the empire, to which, as at other times, religious strifes added considerably, increased greatly during the reign of Zeno,

and the invasions of the Goths were prevented only by gifts and stratagems. Ariadne, widow, of Zeno by her second marriage raised the courtier Silentiarius to the throne under the title Anastasius I. (491–518). By the help of the Goths, this monarch overthrew, after a six years' contest, the robber tribes at Mt. Taurus. A new enemy, however, now appeared on the Danube in the Bulgarians, against whose desolating raids Anastasius built the long wall, to protect the peninsula on which Constantinople lies. The war with the Persians also broke out anew during his reign; and religious tumults often purpled the streets of Constantinople itself. After his death, the army raised Justinus I. to the throne. He maintained his position mainly through the favor of the clergy, whom he had conciliated by his severe persecution of hereties.

His nephew, Justinian (q.v.), succeeded (527–65), and became celebrated by his code of laws, and by the victories of his great generals, Belisarius (q.v.) and Narses (q.v.). But the rapid decline of the empire after his death showed that he had not been able to give it any internal consolidation or vitality. It was during the reign of Justinian that those pestilent contests of the blues and whites against the greens and reds (political factions so named from the colors respectively worn) first attained any consequence; and though the first disturbance was terribly chastised by Belisarius in 532, they continued to distract the capital periodically down to the 7th century. Justin II. (565–78), a weak man, governed by his wife, Sophia, yielded a part of Italy to the Longobards, was unsuccessful against the Persians, allowed the Avari to plunder the Danubian provinces, and ultimately became insane through vexation and anxiety. Tiberius, the capt. of the guard, was then made regent, and after the death of Justin II., received the imperial dignity. He ruled with mildness and prudence (578–82), purchased a peace with the Avari, concluded the war with Persia, and left as his successor the commander-in-chief, Mauricius, who reigned from 582 to 602. Having replaced on the throne the Persian king, Kosroes II., who had been banished by his subjects, he thus secured the peace of his eastern frontiers; but, on the other hand, the war against the Avari did not prosper. His niggardly treatment of the army caused a military insurrection, in which he was slain along with his son; and Phocas, one of his generals, was elevated to the throne. Phocas proved a bad ruler. Through his monstrous vices, tyranny, and incapacity for government, the empire lapsed into still deeper anarchy. Suddenly, however, a deliverer appeared in the person of Heraclius (q.v.), son of the exarch or governor-general of Africa, who headed a conspiracy, marched to Constantinople, overthrew the tyrant, and ascended the throne, 610. But great as was the genius of Heraclius, he had to submit to twelve years of defeat before he could organize and discipline a victorious army. In 622, he opened those magnificent campaigns in which the power of Persia was crushed, and which, in the opinion of Gibbon, were equal to those of Scipio or Hannibal. He lived, however, to see more formidable foes in the Arabs, who, inspired by fanatic zeal, and led by the caliph Omar, captured, during 635–41, the countries on the Euphrates, with Syria, Judea, and Egypt. The power of the Greeks, which was demanded to resist the Arabian invasions, was miserably divided and weakened by their unending religious quarrels, especially the controversy of the Orthodox against the Monothelites (q.v.). The empire was breaking asunder, and Heraclius, now worn out with the fatigues of war, had abandoned his enfeebled senses to pleasure, and his enfeebled intellect to theological discussions. He died in 614. Constantine III., who succeeded his father, Heraclius, also died soon after, and was followed by Heracleonas, who lost the crown, and was mutilated in an insurrection. The next ruler was Constans, the son of Constantine III., who ruled from 642 to 668, made himself odious by cruelty, and perished in an insurrection. His son, Constantine IV., Pogonatus (668–85), enforced a treaty of peace on the invading Arabs (675) by his successful use of the Greek fire, in warfare. On the other side, he was compelled to pay tribute in 680 to the Bulgarians, who had established themselves in ancient Mœsia. Justinian II. (685–711), son and successor of Pogonatus, was victorious in war against the Monothelite Maronites; but was defeated by the Bulgarians (688), and by the Arabs (692). His cruelty caused an insurrection, at the head of which was Leontius, who, in 695, deposed him, cut off his nose (hence his surname *Rhinotmetus*), and banished him to the Taurio Chersonese; in 705, he was restored to the throne, but adversity had taught him no wisdom. A part of his subjects revolted, and the king, abandoned by his army and by the Buglarians, was assassinated in 711. With him the dynasty of Heraclius expired.

Philippicus Bardanes (the leader of the last insurrection against Justinian II.) was next raised to the throne (711); but having made himself odious by favoring the metaphysical tenets of the Monothelites, he was deposed, and brutally deprived of eye-sight (713). His successor, Anastasius II., prudently screened himself from a mutinous army by retiring into a monastery (716), and left the crown to Theodosius III., who abdicated in 717 when Leo, the Isaurian, and gen. of the army of the east, did not recognize him, and marched with hostile intent to Constantinople. Leo (q.v.) himself ascended the throne in 717, and drove back the Arabs from Constantinople, but unhappily gave occasion, in 726, for that contest concerning the worship of images, which rent the empire for more than a century. In 728, the exarchate of Ravenna was lost, and the eastern provinces became the prey of the Arabs, over whom, however, he won a great victory in Phrygia. He died in 741. Constantine V. (741–775), son of Leo III., on account of his zeal as an iconoclast, was hated by the monks, who gave him the surname "Cop-

ronymos," because (according to their malicious and uncleanly statement) he had polluted the font at his baptism. He was a brave ruler, recovered from the Arabs parts of Syria and Armenia, and ultimately defeated the Bulgarians, against whom he had long been unsuccessful. His son, Leo IV. (775–780), was a mild ruler; but by the ability of his generals, he made the boundaries of the empire secure against the Arabs. After him, Constantine VI. ascended the throne under the guardianship of his ambitious mother, Irene (q.v.), who raised a powerful party in favor of image-worship. Constantine having made an attempt to liberate himself from the influence of his mother and her paramour, Stauratius, Irene barbarously caused her own son to be blinded (797). He died soon after this atrocity; and Irene, who had boldly conceived the design of marrying the emperor Charlemagne, and thus uniting the e. and w. of Europe in one vast realm, excited the opposition which, in 802, placed her treasurer, Nicephorus, on the throne. Irene was banished to Lesbos, where she died in 803. Nicephorus, who fell in battle against the Bulgarians (811), was succeeded by his son, Stauratius, who soon yielded the throne to his brother-in-law, Michael I., from whom it was taken by the Armenian gen., Leo V., a powerful ruler, who conquered the Bulgarians, but fell (820) in a conspiracy excited by his zeal against image-worship. Michael II., the stammerer, was raised from a dungeon to the throne, and ruled until 829. In his reign, Crete and Sicily passed into the hands of the Arabs. Under the rule of his son, Theophilus, who is praised by the Byzantine historians for his love of justice (829–842), the gen., Manuel, gained some indecisive victories over the Arabs. Theodora, widow of Theophilus, and guardian of Michael III. (842–867), brought the controversy about images to a close at the council of Nicæa (842), when the worship of these was fully sanctioned and re-introduced. During this reign the government busied itself in the persecution of the Paulicians (q.v.), while the Arabs devastated the Asiatic provinces. Theodora, having been banished to a convent by her son, the government was for some time held by Bardas, uncle of Michael III., and after his assassination, by Basilius I., the Macedonian, who caused Michael to be put to death, and afterwards ruled ably from 867 to 886. But though on the whole successful against the Arabs, the latter contrived to make themselves masters of Syracuse. His dynasty (the Macedonian) maintained itself on the Byzantine throne, with some few interruptions, until 1056. The reign of his son, Leo VI., the philosopher, (886–912), was not prosperous. The inroads of the Bulgarians and of the Arabs, who, in 904, plundered Thessalonica, continued to increase during the government of his son, Constantine VII., Porphyrogenitus, who ruled mildly but feebly (912–959). Under his son, the dissolute Romanus II. (959–963), Crete was retaken from the Arabs by the vigor of his gen., Nicephorus Phocas, who, on the death of the emperor, married his widow, Theophania. She, however, caused him to be murdered in 969, as she wished to marry John Tzimiskes, who ruled till 976, and, like his predecessor, was victorious against the Arabs and Bulgarians, as also the Russians, who about this time began to emerge from obscurity as an enemy of the Byzantine power. His successor, Basilius II. (976–1025), the son of Romanus, conquered the Bulgarian kingdom, and attached it as a province to the empire, which it remained till 1186, when it again became independent. His brother, Constantine VIII. (1025–28), did not resemble him. Romanus III. next ascended the throne, but was assassinated by his wife, Zoe, a profligate but crafty princess, who raised successively to the imperial dignity Michael IV. (1034), Michael V. (1041), and Constantine IX. (1042). Meanwhile, Russians and Arabs devastated the realm. In Asia, the Seljuk Turks proved dangerous enemies; while in lower Italy, the Normans narrowed the Byzantine power to the possession of Otranto. After Constantine's death in 1054, Theodora, sister of Zoe, was elected empress; and on her death in 1056, Michael VI., who was deposed by Isaac I., Comnenus.

With Isaac I., Comnenus, who came to the throne in 1057, the dynasty of the Comnenian emperors began. He retired to a monastery (1059), and was succeeded by Constantine X., whose widow, Eudocia, married Romanus IV., and raised him to the throne. Romanus was deposed in 1071 by Michael VII. (son of Constantine X.), who, in his turn, was dethroned by Nicephorus III. (1078), who reigned until 1081, when he was deposed by Alexius I., Comnenus (q.v.), (1081–1118). This last reign was marked by the commencement of the crusades. The successors of Alexius—his son, Kalo-Joannes (1118–43), and Manuel I. (1143–80)—were able rulers, and victorious in their engagements with the Turks. Manuel's son, Alexius II., was murdered by his guardian, Andronicus (grandson of Alexius I.), who raised himself to the throne. He was the last prince of the Comnenian dynasty, and fell in an insurrection excited by his own cruelty, 1185.

After the first turbulent reign of Isaac II., who was blinded and deposed by his brother, Alexius III., who took the surname of Comnenus in 1195, the crusaders restored Isaac to the throne (1203), and also crowned his son Alexius IV.; but the restless citizens of Constantinople elected Nicolas Kanabus, who took the title of Alexius V., and pursuing the usual bloody course, put his predecessor to death.

In 1204, the French and the Venetians (collectively named *Latins*) advanced on Constantinople, and captured the city, April 12, having made themselves masters of the European provinces. The whole was divided into four parts, of which the first, including the metropolis, fell to the lot of Baldwin, count of Flanders, who was made emperor, and to whom the other participants in the expedition did fealty for their respective shares. The Venetians obtained the coasts of the Adriatic and Ægean seas, a part of

the Morea, and several islands; Bonifacius, count of Montferrat, Macedonia, and part of Greece; several dukedoms, countships, etc., were also established at Athens, Philippopolis, and other places for French knights; while a number of Greek princes, both on the mainland and in the islands, maintained their independence. In the w. of Asia Minor, Theodorus Lascaris, who had been elected emperor at Constantinople, formally transferred the seat of government to Nicæa; and finally, in the n.e. of Asia Minor, the governor of the province of Colchis, Alexius Comnenus, ruled at Trebizond with absolute authority; while one of his successors, John Comnenus, even assumed the title of emperor. At Constantinople, neither Baldwin nor his successors could strengthen the sinking empire. Baldwin himself died (1206) a prisoner in the hands of the Bulgarians. After him came his brother Henry, who ruled bravely and wisely till 1216. For the next four years, the empire was actually without a ruler, and a prey to utter anarchy. In 1221, Robert, son of Peter, count of Auxerre and Courtenay, came to the throne; and was succeeded by John of Brienne, titular king of Jerusalem (1228–37); and the latter by Baldwin II. (1237–61). During these reigns, a great part of the empire was seized by John Vatazes, successor of Theodorus Lascaris of Nicæa (1222–55). This ruler was followed in Nicæa by Theodorus II. (1255–59), whose son, Johannes, during his minority, was superseded by Michael VIII., Palæologus, who, by the help of the Genoese, captured Constantinople (July 25, 1261), and thus put an end to the Latin dynasty; though some few Latin principalities maintained themselves till the fall of the Byzantine empire.

Michael, the first of the Palæologi, a powerful prince, really endeavored to strengthen the realm; but, by his unhappy attempt to unite the Greek church with the Latin, from which it had decisively separated (1054), he gave great offense to the clergy and the people. His son, Andronicus II., who came to the throne, 1282, re-established the Greek ritual. After the death of his son and co-regent, Michael IX. (1320), Andronicus II. was compelled to divide the throne with his grandson, Andronicus III., who became sole emperor, 1328. This monarch unsuccessfully opposed the Turks, who took Nicæa and Nicomedia in 1339, and wasted the European coasts. He died in 1341. Under his son, Johannes V., the Turks first gained a firm footing in the European provinces, and spread themselves from Gallipoli (which they captured in 1357) over other districts. Sultan Murad took Adrianople, 1361, and made it the seat of government. He and his follower, Bajazet, conquered all the Byzantine territories as far as Constantinople. Manuel II., son and successor of Johannes, was besieged in Constantinople by Bajazet, who defeated an army under Sigismund of Hungary, at Nicopolis, in 1396, and compelled the Byzantine monarch to cede to the Turks one of the main streets of the city, which was saved from capture only by Timur's incursions into the Turkish territories, 1402. By this diversion Manuel recovered some portion of the Byzantine provinces; but made so little use of the occasion, that, in 1422, the metropolis was again besieged by Murad II., who, after he had overthrown the force sent to aid the emperor by Ladislaus, king of Hungary, at the battle of Varna, made Constantinople, in 1444, the limit of the domains of Johannes VI., son of Manuel, and compelled him to pay tribute. Constantine XI., brother of Johannes, bravely but fruitlessly contended against the overwhelming Turkish forces, and fell heroically in the defense of Constantinople, which was captured by Mohammed II., May 29, 1453, when the B. E. was brought to a close. The petty Latin princes who existed here and there in Greece, and the despots, Demetrius and Thomas, who ruled in the Morea, were subdued by Mohammed in 1460; while David, a member of the Comnenian dynasty, the last emperor of Trebizond, submitted in 1461.

It is almost superfluous, after this painful and bloody record of dynastic crimes and tumults, continuing century after century for upwards of a thousand years, to affirm that the history of the world never witnessed so miserable and degraded a caricature of imperial government as the B. E. affords, or to express the conviction that nature was sternly satisfied to behold it finally swept from the face of the earth, even by the hands of barbarous Turks.

The constitution of the B. E. was founded on the institutions of Diocletian and Constantine the great, and was purely despotic. The emperors, who were consecrated by the patriarchs of Constantinople, claimed, as the true descendants of the Cæsars, a sovereignty over the west as well as the east, and styled themselves "rulers of the Romans," even after Charlemagne had founded a new dynasty. Though great influence was at various times exercised by the clergy as well as by women, courtiers, and ministers, the emperors were pure autocrats, having supreme power in all departments of government, and being themselves superior to all laws. By pompous titles, by great splendor of costume, and by a strict observance of an elaborately minute court ceremonial, as well as by the cruel penalties inflicted for any insult offered to the imperial dignity, or to the dignity of the emperor's relatives, they kept themselves sacredly apart from the people. Gradually, everything disappeared that might have been a check upon the utter despotism of the supreme power. As early as the 6th c., the consulate was absorbed into the mass of imperial honors, while the traces of the senate which Constantine had established at Byzantium, and which was composed of those on whom the emperor had bestowed the dignity of patriciate, as well as the chartered privileges of the towns, had entirely vanished in the 10th century. The privy council, to whom the conduct of the state was intrusted, was arbitrarily chosen by the emperor. The state officials were very numer-

ous, and their respective ranks carefully distinguished. They were raised far above the populace by titles and privileges, but were utterly dependent on the throne. Among these, the *domestici* (including many eunuchs), claimed the highest rank as immediate attendants on the emperor. The rank of the *curopalates*, who had charge of the four chief imperial palaces, became, in course of time, subordinate to that of the *protovestiarius*, who was invested with the highest dignity of all. The domestici were made commanders-in-chief of the army. Among them, the *domesticus* of the east (styled, *par excellence*, *megadomesticus*) held the highest rank, and finally, under the Palæologi, was considered the first civil and military officer of the realm. The provinces were ruled by governors bound to contribute certain sums to the royal revenue, which gave rise to oppressive exactions. No distinction was made between the state-revenue and the privy-purse. For military service, the land was divided into districts (*themata*); and the army, down to the later times, consisted almost entirely of foreign mercenary troops, the imperial body-guard, or *spatharii*, who were mainly Germans, holding the highest rank. The admiral of the fleet was styled *megas dux*. In the midst of constant internal and external disturbances, the administration of justice was grossly neglected and abused, though Justinian and other emperors earnestly endeavored to establish just laws.

BYZAN′TINE HISTORIANS are those Greek writers who have handled the history of the Byzantine empire. They are divided into three classes—1. Those whose works refer exclusively to Byzantine history; 2. Those who professedly occupy themselves with universal history, but at the same time treat Byzantine history at disproportionate length; 3. Those who write on Byzantine customs, antiquities, architecture, etc. The B. H. are far from faultless, yet, as they are the only sources of information regarding the vast empire of the east, they are invaluable to us. The most interesting and instructive among them, however, are those who confine their attention to a limited number of years, and to the events which transpired under their own observation, or in which they took part. The principal B. H. were collected and published at Paris in 36 vols., with Latin translations under the editorship of P. Philippe Labbé, a Jesuit, and his successors (1648–1711). This magnificent collection was reprinted, with additions, at Venice, 1727–33. In 1828, Niebuhr, assisted by Bekker, the Dindorfs, and others, began a *Corpus Scriptorum Historiæ Byzantinæ*, carried on till 1855, and continued in 1872 by the *Bibliotheca Græca Medii Ævi*.

BYZANTINE RECENSION, the Greek New Testament used in Constantinople after that city became a see in the eastern church: also used as the basis of the old Slavonic version. It differs very little from the received text.

BYZAN′TINES, in numismatics, is the term applied to coins of the Byzantine empire. Byzantine coins are of gold, silver, and bronze; bear impressions distinct from those of the earlier Roman coins; and were copied in several countries where the Byzantine standard was adopted. The commercial relations of the eastern empire served to distribute its coinage over almost all the then known world. It was current in India, as well as in the n. of Europe. Recently, an increased attention has been paid to the study of Byzantine coins as aids to history.—Saulcy, *Essai de Classification de Suites Monétaires Byzantines* (Metz, 1836).

BYZAN′TIUM, a city which stood on the Thracian Bosporus, was first founded by emigrants from Megara in 667 B.C., and rapidly rose to importance as a seat of commerce. Its position was at once secure and enchanting; it commanded the shores of Europe and Asia, had magnificent facilities for trade, and was also encircled with rich, picturesque, and varied scenery. After a time of subjugation under Darius Hystaspes, B. was liberated from the Persian yoke by Pausanias. Along with other Grecian seaports, B. revolted from Athens in 440 B.C., but was captured by Alcibiades (408). Lysander recovered it for the Lacedemonians in 405. Shortly afterwards, it renewed its alliance with Athens, and in 390, Thrasybulus altered its form of government from an oligarchy into a democracy. When Athens again acquired a dangerous importance as a naval power, B., in 356, leagued itself with Chios, Rhodes, and king Mausolus II., of Caria, and crippled the trade of the former city; with which, however, it again formed an alliance, through the influence of Demosthenes, in opposition to Philip of Macedon, who, in 341–340 B.C., vainly besieged Byzantium. Under Alexander the great, B. retained a certain degree of independence. For some time, B. was tributary to the Gauls, who settled in Thrace, after the death of Brennus (280 B.C.). After the second Punic war, when the Romans began to interfere in the affairs of Grecian and Asiatic cities, B. attached itself to Rome, and, retaining almost entire its former liberties, maintained also its commercial importance. In the civil war between Septimius Severus and Pescennius Niger, B. sided with the latter. It was therefore besieged by Severus, and, after a brave defense of 3 years' duration, was captured in 196 A.D., and reduced to ruin. Severus, repenting of the desolation which he had made, rebuilt a part of the city under the name of *Augusta Antonina*, and ornamented it with baths, porticos, etc. Caracalla restored to the inhabitants their ancient privileges; and in 330 A.D., under the name of New Rome or Constantinople, it was made the metropolis of the Roman empire. See CONSTANTINOPLE.

BZOVIUS, or BZOWSKI, ABRAHAM, 1567–1637; a Polish Dominican, one of the most voluminous writers of his time. He was professor of philosophy and theology at Milan and Bologna. He continued the ecclesiastical annals of Baronius from 1198 to 1532.

C

C THE third letter in all the alphabets derived from the Roman. It corresponds in place to the Greek gamma (*Γ*), and had originally the same sound—viz., that of *g* in *gun;* as is expressly recorded, and as is proved by very old inscriptions, on which we read *leciones, lece,* for what were afterwards written *legiones, lege.* This medial or flat guttural sound of *c* was at an early period of Roman history lost in the sharp guttural or *k*-sound (see ALPHABET), and this continued to be the pronunciation of the letter *c* in Latin down at least to the 8th c. of the Christian era, not only in such words as *comes, clamo,* but also before the vowels *e* and *i.* Such Latin words as *Cicero, fecit,* are uniformly represented in Greek by *Kikero, phekit;* and in the times of the empire, the Germans borrowed *Kaiser, keller,* from *Cæsar, cellarium.*

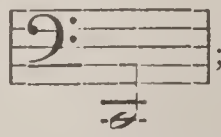
It seems difficult, at first sight, to account for the same letter having sounds so different as those heard in *c*all and in *c*ivil. The beginning of the transition is to be found in the effect produced upon certain consonants by their standing before *i* followed by a vowel. Thus, in *nation, ti* has the effect of *sh*; and out of *diurnal* has sprung *journal.* In such combinations, *i* is originally a semi-vowel having the force of *y,* and it is easy to see that *tyon, dyur,* pronounced in one syllable, cannot but slide into the sibilant or hissing sounds of *shon, jur.* A precisely similar effect is produced on the *k*-sound before *ia, iu, io*; in Lucius, Porcia, or rather Lukyus, Porkya, *ky* tends to slide into a hissing sound similar to that of *ty* and *dy.* This tendency showed itself early in the Latin tongue; and in the vulgar Latin of later ages, and in the Romanic tongues that sprang out of it, it fully developed itself, so that the Italian came to pronounce *Lucia* as if written *Lutshia.* Combinations like *ceo, cea,* are little different from *cio* and *cia,* and would naturally follow the same course; and the *s*-sound being once associated with the letter *c* in these positions was gradually extended to it in cases where the *e* or *i* was not followed by a vowel.

The Anglo-Saxon alphabet resembled the Roman, from which it sprang, in having no *k,* and in always using *c* with the sound of *k; king* and *keen* were spelled *cyning* and *cene.* It was also without *q,* for which *cw* was used—*quick* being spelled *cwic.* By a process analogous to that described above, such Anglo-Saxon words as *ceorl, ceosan* (pro. *kyorl, kyosan*), became transformed into the English *churl, choose.* And this suggests a natural explanation of the multitude of cases where the *c* of the Latin has been transformed into *ch* in French, and has passed in this form into English—*e.g.,* Lat. *caput,* Fr. *chef,* Eng. *chief;* Lat. *caminus,* Eng. *chimney;* Lat. *carmen,* Eng. *charm.* For as the Anglo-Saxons turned the *karl* or *korl* of the other Gothic nations into *kyorl,* so doubtless the Romanized Gauls corrupted the pronunciation of the Latin *camera,* for example, into *kyamera* (compare Eng. *cart,* pro. by some *kyart*), which would then readily slide into *chambre.*

In the other Germanic alphabets, which were derived partly from the Roman and partly from the Greek, the Greek *kappa* or *k* is used almost to the exclusion of *c,* which, in German, Swedish, etc., appears only in words borrowed from the Romanic languages. See letter K.

In modern English, *c* is pronounced like *k* before the vowels *a, o, u,* and like *s* before *e, i,* and *y;* and where the sharp guttural sound has to be represented before *e, i,* and *y,* the Germanic *k* has superseded the Anglo-Saxon *c,* as in *king, keen.* In so far as mere sound is concerned, *c* is a superfluous letter in English; in every case its power could be represented either by *k* or by *s.* In the corresponding words of the several Aryan languages, we find various substitutions for *c,* thus: Lat. *calamus,* Eng. *halm* (stalk), Rus. *soloma;* Lat. *cord-,* Eng. *heart,* Rus. *serdtse;* Lat. *collum,* Ger. *hals* (neck); Lat. *acer* (sharp); Fr. *aigre,* Eng. *eager;* Lat. *duc-* (lead or draw), Ger. *zog,* Eng. *tug;* Gr. *pepo,* Lat. *coquo,* Eng. *cook;* Lat. *dictus,* Ital. *ditto.* C sometimes disappears before *l* and *r;* thus: Gr. *kleo* (to sound one's fame, allied to *kaleo,* to call or shout), Lat. *laudo,* to praise, Ger. *laut,* voice, Eng. *loud,* old Ger. *hlud,* fame (hence Hludwig or Clodowig, Clovis, Louis).

C, in music, is the name of one of the notes of the gamut. The scale of C major has neither flats nor sharps, and therefore is called the natural scale. The different octaves of the gamut, beginning with C, are called by the Germans the great, small, one-stroked, two-stroked, etc., beginning with



; thus, C C, c, $\bar{c}$, $\bar{\bar{c}}$, $\equiv$ c.

C is also the sound on which the system of music is founded, and from which the mathematical proportions of intervals are taken; that is, a string of a given length sounding C, when divided into certain proportions, is made to produce harmonically the intervals of the different fundamental chords.

C MAJOR, the first of the twelve major keys in modern music; being the natural scale, it has no signature.

C MINOR, the tonic minor of C major, has three flats for its signature—viz., B flat, E flat, and A flat.

CAABA. See KAABA.

CAA'ING WHALE, *Globicephalus deductor*, an interesting cetaceous animal, which has been very generally included by naturalists in the genus *delphinus* with dolphins (q.v.) and porpoises (q.v.), being named by some *delphinus melas* (Gr. black), by others *D. globiceps*, from the round form of its head, but which has recently been separated from the true dolphins, either as a species of porpoise (*phocæna*), or as the type of a distinct genus, *globicephalus*, principally characterized by the rounded muzzle, and the convex and rounded top of the head. The general form of the animal is not unlike that of the common porpoise, but it is much larger, being from 16 to 24 ft. in length. The body is thick, its circumference at the origin of the dorsal fin, where it is greatest, being rather more than 10 ft., tapering towards the tail, which is deeply forked. The pectoral fins are remarkably long and narrow, fully 5 ft. in length, differing very much in this respect from those of every other known cetaceous animal. The whole number of vertebræ is 55. The color is black, with a white streak from the throat to the vent; and the skin is beautifully smooth, shining like oiled silk.

The C. W. feeds on cod, ling, and other large fishes, but also to a great extent on cephalopodous mollusca, the cuttle-fish, indeed, seeming to be its principal food. It is the most gregarious of all the cetacea, great shoals or herds being usually seen together in the northern seas which it inhabits. These herds exhibit the same propensity with flocks of sheep, when pressed by any danger, to follow their leaders, so that when they are hemmed in by boats, if one break through to the open sea, all escape; but if one is driven ashore, the rest rush forward with such blind impetuosity as to strand themselves upon the beach, where they become an easy prey and rich prize to their pursuers. The appearance of a herd of caaing whales in a northern bay produces a scene of great excitement, and every boat is in requisition. From 50 to 100 whales are often captured, and it is recorded that 1110 were killed, in the winter of 1809–10, at Hvalfiord, in Iceland. The word *caaing* is not the Scottish form of *calling*, as has been supposed, but is a totally different Scotch word, which signifies *driving*. C. W. appears to be originally an Orkney or Zetland name. The same animal is known to sailors as the black whale, the howling whale, the social whale, and the pilot-fish.—Another species of the same genus, *G. rissoanus*, 9 or 10 ft. long, the male of a bluish-white color, the female brown, both sexes marked with irregular white lines and brown spots, is found in the Mediterranean.

CABAGAN', a thriving t., situated at the northern extremity of the island of Luzon, one of the Philippines. Pop. upwards of 11,000.

CABAL', a term employed to denote a small, intriguing, factious party in the state, and also a union of several such, which, for political or personal ends, agree to modify or sacrifice their principles. The word was used to describe an English ministry in the reign of Charles II., the initials of whose names composed CABAL—viz., Clifford, Ashley, Buckingham, Arlington, and Lauderdale. This was not the origin of the word, however, as some have supposed; but merely the ingenious application of a word previously in use, and which appears to have been derived from the French *cabale*, possessing a similar signification.

CABALA. See CABBALA, *ante*.

CABALLERO, FERNAN. See page 885.

CABANEL, ALEXANDRE, b. 1823; a French painter of mythological and religious subjects, among which are "The Birth of Venus" (of which he made two copies for American patrons), and "Nymph carried off by a Faun." He is a member of the French academy, and a professor in the school of fine arts.

CABANIS, PIERRE JEAN GEORGES, a French physician, philosophical writer, and partisan of Mirabeau in the revolution, was b. at Cosnac, in the department of the Charente-Inférieure, 1757. When he had completed his studies in Paris (1773), he went to Warsaw, in the capacity of secretary to a Polish magnate. On his return to Paris, he was for some time engaged in literary pursuits, from which he turned his attention to an earnest study of medicine. At the outbreak of the revolution, he attached himself to the liberal side, but detested the cruelties which followed. For Mirabeau, whose opinions he received, he wrote a work on national education, which was published after the death of that great orator (1791). C. was one of the council of five hundred, afterwards member of the senate, and administrator of the hospitals of Paris. He died May 5, 1808. His chief work, *Rapports du Physique et du Moral de l'Homme*, completed in 1802, gained its author a considerable reputation as a writer and philosopher. The work displays no mean power of observation and analysis, but is characterized by a sensationalism so absolute, that it seems at first sight as if the author were burlesquing with grave irony the doctrines of his brother-materialists. He denies that the soul is an entity; it is only a faculty; and declares the brain to be merely a particular organ specially fitted to produce thought, as the stomach and the intestines perform the function of digestion. C. traces this grotesque analogy through all its niceties, and at last triumphantly concludes, "that the brain digests impressions and organically secretes thought!"

CABARRUS, a co. in s.w. North Carolina, on the N. C. railroad, watered by Rocky river; 350 sq.m.; pop. '80, 14,964—5120 colored. Soil moderately fertile, producing corn, wheat, cotton, etc. Co. seat, Concord.

CABARRUS, Francisco de, 1752–1810; a Spanish financier, originator of a bank and company for trade with the Philippine islands. He was one of the council of finance under Charles III., and proposed many reforms. Under Charles IV. he was accused of embezzlement and imprisoned, but soon after was released and made a count. Bonaparte made him a minister of finance, in which office he died. His daughter Thérèse, under the name of Mme. Tallien, afterwards princess of Chimay, was conspicuous in the closing days of the French revolution of 1789.

CABATUAN, a city of the province of Iloilo, on the island of Panay, one of the Philippines. It is situated on the banks of the river Tiguin, which so abounds with crocodiles that fishing is unsafe. Navigation is very uncertain, the river being sometimes nearly dry, while at others it overflows its banks, and deluges the surrounding country. The city was founded in 1732, and possesses a population of 23,000, who are chiefly engaged in the production of rice, and of cocoa-nut oil.

CABAZERA, capital of the province of Cagayan, island of Luzon, Philippines. Pop. 15,000. Tobacco is grown very extensively in the province, and its manufacture affords employment to large numbers of people.

CABBAGE, *Brassica oleracea* (see Brassica), a plant in most general cultivation for culinary purposes in Europe and other countries, cultivated also to a considerable extent for feeding cattle. It is a native of the rocky shores of Britain and other parts of Europe, more plentiful on the shores of the Mediterranean than in more northern latitudes, and in its wild state is generally from a foot to two feet high. This plant has been cultivated in Europe from time immemorial; it has likewise been cultivated from an early period in gardens and about villages in India. Few plants show so great a tendency to vary in their form through cultivation; and among the varieties of this one species are reckoned several of our most esteemed culinary vegetables, such as kale (q.v.) or greens, borecole, colewort (q.v.), savoy (q.v.), kohl rabi (q.v.), cauliflower (q.v.), and broccoli (q.v.)—plants which differ much in their appearance and in the particular qualities for which they are valuable, both from each other and from the original wild plant.

The wild C. has smooth sea-green leaves, waved and variously indented; the boiling of the leaves, or their forming close heads at a certain stage of the growth of the plant, so that the inner leaves are blanched, is peculiar to those cultivated varieties which commonly receive the name of cabbage.

The ordinary varieties of C. are often called by the general name of *white C.*, to distinguish them from the *red C.*, which is of a deep brownish-red or purplish color, and is chiefly used for pickling, for which purpose it is much esteemed. The *tree C.*, or *cow C.*, is a variety cultivated for cattle, especially in the Channel islands and the n. of France, of which the leaves do not close together into compact heads, but which is remarkable for its great height—reaching, when it is in flower, 10 ft. on rich soils—and for its branching stem. The stems of this kind are sometimes used as stakes for pease, and even as cross-spars for thatched roofs. The *Portugal* or *tranxuda C.*, also known as *couve tronchuda,* is a variety remarkable for its delicacy, and for the large midribs of its leaves, which are often used like sea-kale. It is an article of luxury like cauliflower, and requires a somewhat similar cultivation.—Cabbage-seed is sown either in spring or autumn, and the seedlings transplanted in rows at distances of two feet or upwards, according to the size of the variety. They are often planted closer, and the alternate plants cut young for open greens, for which the sprouts that arise from the stem of some varieties after the head has been cut off are also used. Cabbages require a rich, well-manured soil, and the earth about the roots ought to be often stirred. By sowing and planting at different dates and of different varieties, a succession is secured in the garden; and when winter approaches, part of the principal crop may be taken up and laid in a sloping position, so that only the heads are above the earth, in which way they are generally preservedwithout injury. In some places, cabbages are completely buried in the earth, the plants not being allowed to touch each other; and this method succeeds well in peaty or sandy soils.

The C., considered as food, contains more than 90 per cent of water, and therefore cannot be very nutritious: 100 parts of the ordinary C. consist of

Extractive	2.34
Gummy matters	2.89
Resin	0.05
Vegetable albumen	0.29
Green fecula	0.63
Water and salts	93.80

The digestibility of C. varies according as it is partaken of raw or boiled; thus, raw C. alone is digested in 2½ hours; raw C., with vinegar, in 2 hours; and boiled C. takes 4½ hours. Immense quantities of cabbages are used in Germany as *sauer kraut* (q.v.).

CABBAGE BARK. See Andira.

CABBAGE BUTTERFLY, a name common to several species of butterfly, the larvæ of which devour the leaves of cruciferous plants, especially of the cabbage tribe, and are popularly known as cabbage-worms or kale-worms. The large C. B., or large white garden butterfly (*pontia brassicæ*, or *pieris brassicæ*), is one of the most common of British butterflies. It is white; the wings tipped and spotted with black. The wings, when expanded, measure from 2½ to 3 in. across. The antennæ terminate in an ovoid club. The female lays her eggs, which are conical and bright yellow, in clusters of 20 or 30, on the leaves of the plants which are the destined food of the caterpillars. The caterpillars, when fully grown, are about 1 in. or 1½ in. long, and are excessively voracious, eating twice their own weight of cabbage-leaf in 24 hours. When full grown, they suspend themselves by their tails, often under ledges of garden-walls, or similar projections, and are metamorphosed into shining pale-green chrysalids, spotted with black, from which the perfect insect emerges, either in the same season or after the lapse of a winter—no longer to devour cabbage leaves, but to subsist delicately upon honey, which it sucks from flowers.—See Insects.—The small C. B., or small garden white butterfly, sometimes called the turnip butterfly (*pontia* or *pieris rapæ*), very much resembles the large C. B., but the expanse of the wings is only about 2 inches. The eggs are laid singly on the under side of the leaves of cabbages, turnips, etc., and the caterpillars, which are of a velvety appearance, pale green, with a yellow line along the back, and a yellow dotted line on each side, sometimes appear in great numbers, and prove very destructive. They bore into the hearts of cabbages, instead of merely stripping the leaves, like those of the last species, and thus are a greater pest, even when comparatively few. The chrysalis is of a pale reddish-brown color, freckled with black.—A third species, also common in Britain, the green-veined white butterfly (*pontiaorpieris napi*), very nearly resembles the small cabbage butterfly.—The excessive multiplication of these insects is generally prevented by small birds, which devour them and their caterpillars, and by insects of the *ichneumon* (q.v.) tribe, which lay their eggs in the caterpillars, that their own larvæ may feed on them.

CABBAGE FLY, *Anthomyia brassicæ*, a fly of the same family with the house-fly, flesh-fly, etc., and of which the larvæ or maggots often do great injury to the roots of cabbages, and sometimes to those of turnips. It is of the same genus with the fly generally known as the turnip fly (q.v.), and also with the potato fly (q.v.), beet fly (q.v.), etc. It is about one fourth of an inch in length, and half an inch in expanse of wings; of an ash-gray color; the male having a silvery gray face, and a long black streak on the forehead; the female, a silvery-white face, without any black streak; the abdomen of the male is linear, that of the female terminates conically; the eyes of the male nearly meet on the crown, those of the female are distant, with a broad black stripe between them. The larva is very similar to that of the flesh-fly—yellowish white, tapering to the head, which has two black hooks. The pupa is rust-colored and horny.

CABBAGE MOTH, *Mamestra* or *Moctua brassicæ*, a species of moth, the caterpillar of which feeds on cabbage and turnip leaves, and is sometimes very destructive. The caterpillar is greenish-black, and changes to a brown pupa in autumn. The perfect insect is of a rich mottled-brown color, the upper wings clouded and waved with darker brown, and having pale and white spots, a yellowish line near the fringe, the fringe dotted with black and ocher, the under-wings brownish and white.

CABBAGE PALM, or Cabbage Tree, a name given in different countries to different species of palm, the great terminal bud of which—the palm cabbage—is eaten like cabbage. The C. P. of the West Indies is *areca oleracea*. The southern states of America have also their C. P. or cabbage tree, otherwise called the palmetto (*chamærops palmetto*). See Areca, Euterpe, Palm, and Palmetto.

CABBALA (from Heb. *kibbel*, to receive), the received doctrine, by which is not to be understood the popularly accepted doctrine, but that inner or mystical interpretation of the law which the Cabbalists allege that Moses received from God in the mount, and subsequently taught to Joshua, who in his turn communicated it to the 70 elders, and which has ever since been the treasure of the select Jews. Since the 12th c., the study of this secret lore has gradually resulted in a distinct school and literature, the elements of which, however, are already visible in the Macedonian epoch, and the real or historical source of which is to be found in the eastern doctrine of emanation. In Philo, in the Talmud, etc., we certainly find theologico-philosophical conceptions, which were at a later period taken up and modified; but the first book on cosmogony is *Jezirah*, a production of the 7th c., attributed to Akiba. After the second half of the 12th c., the Cabbalistic doctrines, which had at first been confined to such high themes as God and creation, began to include exegesis, ethics, and philosophy, and so became a kind of mystical religious philosophy. The numerous Cabbalistic writings composed during the three subsequent centuries, professed to teach the secret or mystical sense of Holy Writ, and the principles on which it is grounded, the higher meaning of the law, as well as the method of performing miracles, by the use of divine names and sacred incantations. The Cabbalists, moreover, prepared books, which they attributed to the oldest authorities—for instance, *Sohar*, a work written in Aramaic. during the 13th c., and fathered upon Simeon-ben-Joachai, a scholar of Akiba. This became the Bible of the Cabbalistic

neophytes. The chief opponents of the Cabbalists were the philosophers, and in part the Talmudists. Towards the close of the 16th c., the Cabbalistic wisdom, which by that time had degenerated into magic and word-juggling, received a new impulse from its teachers in Palestine and Italy. Since the time of Reuchlin, many Christian scholars have investigated the subject.

CABEÇA DE VACA. See NUÑEZ ALVAR.

CABELL, a co. in s.w. West Virginia, on the Ohio river at the Chesapeake and Ohio railroad, watered by Guyandotte river. It is hilly but fertile, producing corn, tobacco, etc. Co. seat, Barboursville. Pop. '80, 13,746—905 colored.

CABEIRI, divinities anciently worshiped in Egypt, Phœnicia, Asia Minor, and Greece. The ancients have left us very obscure notices of the C., and learned men have been unable to reach any satisfactory conclusions with regard to them and their worship. It is certain that the worship had both its mysteries and its orgies, and it appears also that the C. were amongst the inferior divinities, and regarded as dwelling upon the earth, like the Curetes, Corybantes, and Dactyles, and were probably representatives of the powers of nature.

CABEN'DA, or KABINDA, a seaport in Loango, lower Guinea, on the Atlantic, at the mouth of the Livingstone, 5° 30′ south. It is one of the few salubrious places on the coast. Pop. 16,000.

CA'BÉS, or KHABS, GULF OF (ancient *Syrtis Minor*), an inlet of the Mediterranean sea, lying between the islands of Kerkenna and Jerba, on the n.e. coast of Africa, in lat. about 34° n., and long. from 10° to 11° east. The town of Cabes (ancient *Tacape*) stands at the head of the gulf.

CABET, ÉTIENNE, a notable French communist, was b. at Dijon, Jan. 2, 1788, and educated for the bar, but turned his attention to literature and politics. Under the restoration, he was one of the leaders of the Carbonari (q.v.), and in 1831 was elected deputy for the department of Côte d'Or. Soon afterwards, he published a *History of the July Revolution* (1832), started a radical Sunday paper, *Le Populaire* (1833), and, on account of an article in this paper, was sentenced to two years' imprisonment, but escaped to London. Here he wrote brochures against the July government, and began his communistic studies. After the amnesty, 1839, he returned to Paris, and published a *History of the French Revolution* (4 vols., 1840), bestowing great praise on the old Jacobins. He attracted far more notice by his *Voyage en Icarie* (1840), a "philosophical and social romance," describing a communistic Utopia. The work obtained great popularity among the working-classes of Paris. C. next proceeded to turn "his philosophical romance" into a reality, and published (1847) in his journal, *Le Populaire,* the statutes for the formation of an "Icarian colony" on the Red river in Texas; inviting his followers to emigrate. The first division sailed on the 2d Feb., 1848, but a short experience convinced them that Texas was anything but a Utopia. Their complaints reached Europe, but did not deter C. from embarking at the head of a second band of colonists. On his arrival, he learned that the Mormons had just been expelled from Nauvoo, in Illinois, and that their city was left deserted. The Icarians established themselves there in May, 1850. C. now returned to France, to repel the accusations against his probity which had been circulated during his absence, and to obtain a reversal of the judgment which had been formally pronounced against him, 30th Sept., 1849. Having succeeded in this, he went back to Nauvoo, where he governed, as a sort of dictator, his petty colony, until 1856, when he was deprived of his office, and obliged to flee to St. Louis, where he died 9th Dec. of the same year. C. was a shallow thinker, a weak ruler, and a poor writer; but his success, such as it was, is a proof of what can be accomplished by what has been termed, with more vigor than elegance, "pig-headed perseverance."

CABE'ZA DEL BUEY, a t. of the new province of Badajoz, Spain, about 86 m. e.s.e. of the city of Badajoz. It is situated on the northern slope of the Sierra Pedregoso, has manufactures of woolens and linens, and a trade in cattle and agricultural produce. Pop. 6500.

CABE'ZA DEL BUEY, a small t. of Spain, in the province of Badajos, 86 m. e.s.e. of the town of Badajos, on the n. slope of the Sierra el Pedrose. The town is tolerably well built, and has a number of churches and other public buildings. Pop. 5395, engaged chiefly in the manufacture of woolen and linen cloths. [From *Chambers's Supplement.*]

CABEZON DE LA SAL, a t. of Spain, in the province of Valladolid, about 7 m. n.n.e. of the city of that name. It is situated on the Pisuerga, and is celebrated as the scene of one of the first battles of the peninsular campaign, in which the Spaniards were signally defeated by the French. Pop. 2000.

CABIN is the general name for a room or apartment on shipboard. In ships of war, the living-rooms of the admirals and captains are called "state" cabins, and are fitted up with much elegance, with a gallery or balcony projecting at the stern. The chief officers below the captain have their cabins on either side of the main-deck; while those of the subordinate commissioned officers are, in large ships, on either side of the lower or orlop deck. All the cabins of a ship of war are inclosed by light paneling, which is quickly removable when preparing for action.

CABIN CREEK, W. Va. See page 885.

CABINET (Ital. *gabinetto*), a small chamber set apart for some special purpose, such as the conservation of works of art, antiquities, specimens of natural objects, models, and the like. From signifying the chamber in which such collections are contained, the term C. has recently come to be employed by us, in imitation of the French, to signify the collections themselves, and this even when they fill many rooms or galleries. It often means simply a small room appended to a larger one, when it is also called an ante-room, a retiring-room, and the like. See CLOSET.—CABINET PICTURE, a picture suited for a cabinet or small room. C. pictures are generally small in size, highly finished, and thus suited for close inspection.

CABINET (see MINISTRY, *ante*), in political affairs, the heads of departments who are the immediate advisers or counselors of the chief executive. In the United States government the cabinet consists of the secretaries of state, treasury, war, navy, and interior, the attorney-general and the postmaster-general. They meet whenever desired by the president, but not publicly. No minutes are kept of their doings, nor are the names of those present recorded. The president presides; and he may at any time require in writing the opinion of any of the members upon matters concerning his department. But the cabinet has no responsibility, as that rests with the president alone.

CABIRI, or CABEIRI, divinities worshiped in Egypt, Phenicia, and other countries, but of which worship or its purpose little is known. The worship was observed yearly and the ceremonies lasted nine days, always in secret, though women and children were admitted. In Lemnos all the fires were extinguished, sacrifice for the dead was offered, and a sacred vessel was sent to Delos to procure new fire, which was distributed among the people, and with its kindling they began a new or regenerated life, free from sin.

CABLE is either a large rope, or a chain of iron links, chiefly employed on shipboard to suspend and retain the anchors. Rope cables are made of the best hemp, twisted into a mass of great compactness and strength. The circumference varies from about 3 in. to 26. A certain number of yarns are twisted to form a *lissum;* three lissums are twisted in an opposite direction to form a *strand;* and three strands are twisted (in the same direction as the yarns in a lissum) to form a *cable.* The number of yarns in a C. of given size is not always alike, because the yarns slightly vary in thickness; but the following is one among many tables which have been prepared relating to cables of 120 fathoms, and of the usual degrees of thickness:

Inches Circumference.		Yarns.		Lbs.
3	=	48	=	192
6	=	174	=	696
9	=	393	=	1572
12	=	699	=	2796
15	=	1093	=	4372
18	=	1574	=	6296
20	=	1943	=	7772

Some cables are made with four strands, but three is the common number. If a C. be twisted too much, it is stiff; if too little, it is weak. The strength of a C. of 18 in. circumference is found to be about 60 tons; and for other dimensions, the strength varies according to the cube of the diameter. On shipboard, cables receive the names of *chief* cables, *bower* cables, etc., according to the anchor to which they are attached. During the great war ending in 1815, the largest ships in the British navy carried ten cables, most of which were about 2 ft. or a little more in circumference. Although ships seldom anchor at a greater depth than 40 fathoms, it is not deemed safe to trust the anchor to one C. of the usual length; two are spliced together at the ends. The hempen cables now made are generally 101 fathoms; but 100 fathoms in practical seamanship denotes "a cable's length," and is really the length of a chain cable.

CHAIN CABLES are made of links, the length of each of which is generally about six diameters of the iron of which it is made, and the breadth about three and a half diameters. In government contracts, chain cables are required to be made in 12½ fathoms lengths, with one swivel in the middle of every alternate length, and one joining-shackle in each length. The stay-pins, to strengthen the links, are of cast iron. The bar or rod from which each link is made, has the two ends cut diagonally; it is bent into the form of a nearly complete oval ring; and then the two ends are joined and welded, the stay-pin being at the same time introduced at the proper place. Besides the ordinary links, there are end-links, joining-shackles, splicing-tails, mooring-swivels, and bending-swivels. The sizes of chain cables are denoted by the thickness of the rod-iron selected for the links. The following table gives certain ascertained quantities concerning the cables in ordinary use:

Thickness of Iron.	Weight of Stay-pin.	Weight per Fathom.	Breaking Strain.
½ inch.	½ oz.	13½ lbs.	6 tons.
1 "	3½ "	54 "	24 "
1½ "	12 "	121 "	60 "
2 "	28 "	215 "	99 "
2¼ "	40 "	272 "	126 "

By the chain cables act of 1871, certain bodies are licensed to erect machines for testing all chain cables and anchors; and it is forbidden to sell or purchase, under a penalty of £50, any chain cable or any anchor weighing more than 168 lbs., which has not been duly tested. Minor alterations were introduced by a later act (1874), leaving the main rules intact.

CABLE, GEORGE W. See page 885.

CABLE-MOLDING, in architecture, is a molding cut in the form of a rope, the twisting being prominently shown. It was much used in the later Norman style.

CABLING, the molding by which the hollow parts in the flutes of columns and pilasters in classical architecture are often partially filled. The C. seldom extends beyond the third part of the shaft from the ground.

CABOCHED, or CABOSSED, an heraldic term, from the old French word *caboche*, the head. When the head of an animal is borne, without any part of the neck, and exhibited full in face, it is said to be caboched.

CABOCHIENS, certain butchers of Paris, named from their chief Jean Caboche, who were partisans of John of Burgundy against the Armagnacs. In 1418, their outrages provoked the people of Paris to rise against them.

CABOOSE, or CAMBOOSE (Danish, *kabyse*, a cook's room in a ship; Ger. *kabuse*, a little room), is the name of the kitchen or cook-room in a merchant-ship. In coasting-vessels, the term is applied to a portable cast-iron stove on the deck, where food is cooked.

CABOT, the name of two Venetians, father and son, both celebrated as navigators and discoverers.—GIOVANNI CABOT, or CABOTTO, the father, whose business compelled him to reside much in Bristol, was appointed by Henry VII., Mar. 5, 1496, to the command of a squadron of five vessels on a voyage of discovery in the Atlantic ocean. In this expedition he was accompanied by his sons Ludovico, Sebastiano (born at Bristol, 1477), and Sanzio. On the 24th of June, 1497, the coast of Labrador, North America, was sighted. The merit of this discovery has been generally ascribed to the navigator's second son, Sebastian C., the most scientific of the family; but an extract from a chart preserved by Hakluyt mentions the father before the son. The expedition returned in Aug., 1497. In 1498, a second was made, with what results we do not know; and in 1499, a third to the gulf of Mexico. About this time, Giovanni, the father, appears to have died, and we hear no more of *Sebastian* till 1512, when he entered the service of Ferdinand, king of Spain. During the year 1515, he was engaged in revising maps and charts in connection with his profession, and in planning an exploration of the n.w. passage to Asia, which, however, was laid aside on account of the death of Ferdinand in 1516. C., who seems to have been no favorite with the Spanish courtiers, was now subjected to a series of contemptible insults. This usage induced him to return to England, and in 1517, he was appointed by Henry VIII. to the command of an expedition to Labrador. He reached lat. 67½° n., and entered Hudson's bay, where he gave names to several places; but the expedition proved on the whole a failure, on account of the cowardice or malice of his vice-commandant, sir Thomas Perte. C. now entered again into the Spanish service, was made pilot-major of the kingdom by Charles V., and commanded an expedition which examined the coast of Brazil and La Plata, which he attempted to colonize. In 1531, he returned to Spain, and resumed his old situation; but in 1548, he once more betook himself to England, where he was well received by king Edward VI., who made him inspector of the navy, and gave him a pension. To this monarch he seems to have explained the variation of the magnetic needle in several places, which he was among the first, if not the very first, to notice particularly. In 1553, C. was the prime mover and director of the expedition of merchant adventurers which opened to England an important commerce with Russia. It is not known exactly when C. died.—*Memoir of Sebastian Cabot* (Lond. 1831).

CABOT, GEORGE, 1751–1823; b. Mass.; in early life a ship captain, but in 1776 chosen to the Massachusetts provincial congress. He was also in the state constitutional convention, and in 1789 was chosen U. S. senator. He was offered but declined the position of secretary of the navy. His last political act was to preside over the Hartford convention.

CABOTVILLE. See CHICOPEE, *ante*.

CABOTZ. See CUSSO.

CABRA (ancient *Ægabrum*), a t. of Spain, in the province of Cordova, 30 m. s.e. of the city of that name. C. is irregularly built between two hills, and surrounded with gardens; vineyards in the neighborhood produce excellent wine. It is chiefly agricultural; but it has manufactures of woolen, linen, hats, soap, earthenware, etc. Pop. 12,000.

CABRAL, FRANCISCO, 1528–1609; a Portuguese Jesuit missionary at Goa, and superintendent of the mission schools in India. He also labored in Japan with success, and had the supervision of missions in China. He was for nearly 40 years at the head of the Roman Catholic school in Goa.

CABRAL, or **CABRERA**, PEDRO ALVAREZ, the discover of Brazil, was descended from an old and patrician Portuguese family. Nothing is known of his early life, save the fact, that he must have recommended himself by talent and enterprise to king Emanuel

of Portugal, who, after the first voyage of Vasco de Gama, appointed C. to the command of a fleet of 13 vessels, carrying 1200 men, and bound for the East Indies. On the 9th Mar., 1500, he sailed from Lisbon. To avoid the inconvenience of being becalmed on the coast of Africa, he took a course too far westerly, fell into the South American current of the Atlantic, and was carried to the unknown coast of Brazil, of which he claimed possession for the king of Portugal, April 24, 1500, naming the new country "Terra da Santa Cruz." After sending home one vessel to bear news of this great accidental discovery, C. sailed for India; but on the 29th of May, four of his vessels foundered, and all on board perished, including Diaz, the great navigator; and soon afterwards three more vessels were lost. C. therefore landed at Mozambique, on the e. coast of Africa, of which he first gave clear information, and also discovered (Aug. 23) the Antschedives islands, of which he described correctly the position. Hence he sailed to *Calicut*, where, having made the terror of his arms felt, he was permitted to found a factory; entered into successful negotiations with native rulers, and thus established the first commercial treaty between Portugal and India. He returned from India, bringing with him a considerable booty, and arrived in the port of Lisbon, July 31, 1501. It appears probable that the king was dissatisfied with the results of the expedition (although it had annexed Brazil to the crown of Portugal), for subsequently we find no mention made of C. among other discoverers. At the request of C., Sancho de Toar wrote a description of the coast of Sofola. C.'s voyages are described in Ramusio's *Navigatione e Viaggi*, 3 vols. (Venice, 1563; new ed., Venice, 1835).

CABRE'RA, a small island in the Mediterranean, lying off the southern point of Majorca. It is about 3 m. in length and breadth, with an irregular coast, and is little else than a barren calcareous rock. The only interest attached to C. is, that during the war in the Peninsula it formed a Spanish depot for French prisoners, who were crowded in thousands into the desolate spot, and treated with great barbarity; of which an account is given in a popular work, entitled the *Adventures of a French Sergeant*.

CABRE'RA, Don Ramon, the boldest leader of the Carlist party in Spain, was b. at Tortosa, in Catalonia, 31st Aug., 1810. The death of Ferdinand, in 1833, gave the signal for a civil war, and first brought C. into notice. Placing himself at the head of some guerilla troops, he joined the absolutists, or partisans of Don Carlos, and by his vigilance, energy, and daring soon rose to be second in command in the Maestrazgo district. Throughout Aragon and Valencia his name became a by-word for cruelty. After penetrating as far s. as Andalusia, his forces were completely routed by the royal troops, on the borders of Aragon, and he himself, severely wounded, escaped with difficulty into the woods. It was now rumored that C. was dead, when all at once he reappeared at the head of 10,000 foot and 1600 horse. Invading the province of Valencia, he overthrew the royal army at Buñol, 18th Feb., 1837, and again on the 19th Mar. at Burjasot; but was in his turn vanquished at Torre Blanca, and once more compelled to seek a hiding-place. Shortly after, he reopened the war with fiery energy. Madrid itself was threatened by C., who, about this time, received the title of count of Morella for his vigorous defense of the fortress of that name, and was also appointed governor-general of Aragon, Valencia, and Murcia. The Carlists now believed that the triumph of absolutism was approaching, when the treachery of the Carlist gen., Marotto, changed the whole aspect of affairs, and Don Carlos fled from Spain. C. held out until Espartero forced him to quit the country in the summer of 1840. He then entered France, where he was taken prisoner, and confined for a short time in the fortress of Ham. In 1845, he strongly opposed Don Carlos's abdication of his rights. On the outbreak of the French revolution in 1848, he renewed the struggle on behalf of absolutism in Spain; but the adventure proved a miserable failure, and on the 17th Jan., 1849, he recrossed the Pyrenees, to live in retirement. He afterwards married a wealthy English lady, Miss Marianne Catherine Richards. When Alphonso was proclaimed king of Spain in 1875, C. advised the Carlists to submit to him, chiefly because he was "a good son of the church." He died 24th May, 1877.

CABUL', a river in Afghanistan, rises in lat. 34° 21′ n., and long. 68° 20′ e., on the southern declivities of the Hindu Kush or Indian Caucasus. Its source is 8400 ft. above the level of the sea; and an eastward run of 320 m., with a fall of about 7500 ft., along n. Afghanistan, through the Khyber mountains, and across Peshawur, carries it into the Indus, opposite to Attock, in the Punjab. The point of confluence marks the head of navigation on the main stream, while the tributary itself is practicable about 50 m. upwards for craft of 40 or 50 tons. By means, therefore, of the two taken as one line, there exists an available communication of about 1000 m. between the Khyber mountains and the Indian ocean. The C. washes the cities of Cabul, Jelalabad, and Dobundee.

CABUL' is the name given to that part of Afghanistan (q.v.) which lies s. of the Hindu Kush, and is drained by the Cabul river. It extends from the s. of Ghiznee to the Hindu Kush, and from Bamian (q.v.) to the Khyber pass. This region has long occupied a prominent position in the world. Through it, as the passage from Persia to India, Alexander the great marched to complete his eastern conquests; from it issued Mahmoud of Ghiznee, the first Mohammedan invader of Hindustan.

The city of Cabul, from which the surrounding territory takes its name, has 60,000

inhabitants, and stands in lat. 34° 30′ n., and long. 69° 6′ e., near the point where the river, here crossed by three bridges, ceases to be fordable. Elevated about 6400 ft., and overtopped, within a short distance to the n., by pinnacles of the Hindu Kush, about 14,000 ft. higher than itself, C. has a severe winter, and a temperate summer, ranging from 75° to 85° F. The city was formerly surrounded with an earthen wall, which no longer exists. It is separated into different quarters, for defense, by stone walls—the Bala Hissar, or citadel proper, being on the e., and the Kuzzilbashes or Persians having a strongly fortified quarter on the s.w. In the days of sultan Baber, C. was the capital of the Mogul empire. In more recent times, it has witnessed some of the most momentous events in Anglo-Indian history. In 1839, it was taken by the British; in 1841, it was lost through a treacherous outbreak, which led (6th Jan., 1842) to the massacre of about 4000 soldiers and 12,000 followers; and, finally, after being recovered by gen. Pollock in the same year, it was abandoned, its bazaars and public buildings having previously been burned to the ground.

After the death of Dost Mohammed, ameer of Afghanistan, Shere Ali, the son whom he had selected as his heir, had to fight for the possession of C. with Uzful Khan, his elder brother, and the son of the latter, Abdulrahman, who had married a daughter of the khan of Bokhara. Shere Ali was at first unsuccessful. On May 21, 1866, Uzful entered C. in triumph, and was proclaimed ameer of Afghanistan. He applied to sir John Lawrence, the Indian viceroy, to recognize him, but the request was declined on the ground that Shere Ali remained in possession of a large part of Afghanistan. At the death of Uzful, his brother Azim took the title of ameer, not of Afghanistan, but of C. and Candahar. In the end of 1868, Shere Ali, aided by his son Yakoob, obtained possession of C., which became again the capital of Afghanistan. At the close of the war of 1878–79, Yakoob, ameer of Afghanistan, agreed that there should be an English resident at Cabul.

CACA′O. See Cocoa.

CACCA′MO, a t. in the province of Palermo, Sicily, about 6 m. s.w. of Termini, with a pop. of 7200.

CA′CERES, a t. of Spain, capital of the new province of Caceres, is situated on a river of the same name, about 25 m. w. of Truxillo, in a rich agricultural district. It is famous for its bacon; has manufactures of linen, woolens, leather, hats, soap, etc.; dye-works and flour-mills, and a large trade in the produce of the district. It is the *Castra Cacilia* of the Romans, and many relics of its antiquity are still found. It is rich in architecture of the feudal period, and has one of the largest and finest bull-rings in Spain. Pop. 14,000.

CA′CERES, Nue′va, a t. of the Philippines, in the province of South Camarines, on the island of Luzon. It is situated on the river Naga, or Santa Cruz, between the bay of San Miguel and the gulf of Ragay, about 175 m. s.e. of Manila. Pop. 12,000.

CACHA′O, capital of the province of Tonquin, and the largest city in the kingdom of Anam (q.v.), having an estimated population of 100,000. It stands about 100 m. from the sea, on the Tonquin river, which is thus far navigable for small-craft. It has a considerable trade, sufficient to have at one time attracted English and Dutch factories. The exports are bullion, silks, and lacquered ware; and the imports are pepper, arms, long cloths, chintzes, and manufactured goods generally. The port is open to all nations.

CACHAR′, or Hairum′bo, a district of British India, since 1874 included in the chief commissionership of Assam, between 24° and 26° n. lat., and 92° and 93° 30′ e. long. With an area of 1285 sq.m., it contained, in 1881, 356,705 inhabitants. It is mostly mountainous and uncultivated. Its principal river is the Barak, which, after a singularly tortuous course of 350 m., enters the Brahmaputra about 40 m. above Dacca. The territory produces rice, cotton, tea, sugar, timber, bamboo, iron ore, wax, and ivory; and imports salt, cloths, tobacco, and ghee or half liquid butter.

CACHE (Fr. a lurking-hole), the name given by parties of travelers in the great western prairies of the United States to places for concealing provisions and other articles. Designing to return on their tracks after crossing the Rocky mountains, they disburden themselves of what articles can be spared, and, to conceal them from the Indians, construct places of deposit in the wilderness. The making of a C. is a matter of much labor and ingenuity. A hole is dug to a depth of perhaps 6 or 8 ft. and several feet broad, and then the articles being interred, the surface is replaced with the utmost possible care. The excavated earth is also carefully removed, so as to leave no trace whatever of the excavation. The situation of the C., however, is known to the party by some landmark, and returning months afterwards, they probably find its contents undisturbed.

CACHE (*ante*) (a hiding-place), usually a cavity, natural or artificial, in the ground or among rocks, where voyagers and explorers stow provisions or records, to be found by themselves or others. If containing provisions, the cache needs to be very strong to resist the depredations of animals.

CACHE, a co. in n.e. Utah, on the Idaho frontier, watered by Bear river; 700 sq.m.; pop. '70, 8229; in '80, 12,561. Productions agricultural. Co. seat, Logan.

CACHE'O, or CACHEU, a t. in Senegambia, w. Africa, in the land of the Papels, a few miles from the mouth of San Domingo or Cachoa river; pop. 15,000. It is a Portuguese fortified post, and has trade in ivory and gold dust.

CACHET, LETTRES DE. See LETTRES DE CACHET.

CACHE'XIA, a name applied by physicians sometimes to a group of diseases, and sometimes to the constitutional state accompanying a particular disease—e.g., cancerous C., gouty C., mercurial cachexia. The word is derived from the Greek *kakos*, bad, and *hexis*, a habit, and signifies simply a *bad habit of body*, without reference to the cause of illness. From Cullen's having in modern times given extensive circulation to the word, as indicating a large group of chronic diseases, in most of which there are complicated changes in the blood and in the solid textures, C. has come to be chiefly employed with reference to diseases in which the general nutrition of the body is at fault, and in which the local disorders are supposed to be the result of a constitutional cause. Thus, cancerous C. indicates the peculiar impoverished state of the blood and general debility which are associated with the deposits of cancer in various parts of the body; gouty C., the state of the general system in gout, as opposed to the mere local attack of gout in the foot, etc. The cachexiæ differ from the fevers in being much slower in development, and, for the most part, in having no natural termination at a fixed period. See CRISIS.

CACHICAMA, or TATOU-PEBA, *Dasypus novem-cinctus*, an armadillo in tropical America, covered with horny plates. It is about 1¼ ft. long, harmless, and easily tamed. Its food is ants and other insects.

CACHOE'IRA, or CAXOEIRA, a t. in Brazil, in the province of Bahia, and 62 m. n.w. of the city of Bahia; pop. 15,000. It has a town-house, a prison, a Carmelite convent, and several churches. Its trade is in tobacco, coffee, and sugar.

CA'CHOLONG, a beautiful mineral, regarded as a variety of opal (q.v.). It is sometimes called pearl opal, or mother-of-pearl opal. It is generally of a milk-white color, rarely with a yellowish or reddish tinge, opaque and dull or pearly and shining, and has a flat conchoidal fracture. Among the localities in which C. is found are the Giants' Causeway and the Faröe islands.

CACHOLOT, CACHALOT, SPERMACETI WHALE, or SPERM WHALE, *Physeter macrocephalus* or *catodon macrocephalus*, one of the largest of the *cetacea* (q.v.), very peculiar in form and appearance, much sought after not only on account of the oil, but still more on account of the spermaceti (q.v.) which it yields. Ambergris (q.v.) is also obtained from it. The C. belongs to the family of *cetacea* called *physeteridæ*, or *catodontidæ*, of which some naturalists still think that there is only one well-ascertained species. There appears, however, to be pretty good reason for thinking that at least two species exist, both of which are occasional visitants of the British shores—the common C., having no dorsal fin, and the high-finned C. (*physeter tursio*) having a very high dorsal fin. The common C. has a very wide geographical range. It may almost be said to inhabit all seas, although it is most abundant in those of the southern hemisphere. It is not of frequent occurrence on the European shores, although it sometimes enters the Mediterranean, and is occasionally stranded on the coasts of Britain. An individual, 54 ft. long and 30 in circumference, ran ashore on Cramond island, in the firth of Forth, in 1769, and was very particularly described in the *Philosophical Transactions* by Mr. Robertson of Edinburgh. Twelve were caught at Walderwich, on the Suffolk coast, in 1788. The C. sometimes reaches the length of 70 or 80 feet. The head is enormously large, forming about one half of the entire bulk of the animal, and occupying more than one third of the entire length. From the head, the body tapers to the tail, and at last rather rapidly. The general color is very dark gray, nearly black on the upper parts, lighter beneath. Old males, or, in the language of the South Sea whalers, old bull-whales, usually have a large gray spot on the front of the head. The muzzle is very obtuse, almost as if suddenly cut off in front, the breadth of it almost equaling the thickness of the body. In a protuberance on the upper part of it, is the blow-hole, which is single, situated a little on the left side, and in form not unlike the letter S elongated. The mouth is very large and wide; and the throat, unlike that of the Greenland whale, is very wide, sufficiently so to admit the body of a man. The upper jaw projects some feet beyond the lower, and is destitute both of teeth and whalebone; the lower jaw has from 20 to 25 teeth on each side, according to the age of the animal. The teeth are conical and slightly recurved, projecting about 2 in. from the gum. The lower jaw is extremely narrow, the two branches being in contact throughout the greater part of its length: it fits into a groove in the upper, in which are cavities for the teeth. The eyes are small, and placed far back in the head, above the angles of the mouth; the left eye is said to be smaller than the right. Just above the eyes, the dorsal line rises considerably; the dorsal fin is also represented by a protuberance about half-way between the neck and the tail; and these parts are seen above water in the ordinary swimming of the animal, which is at the rate of from 3 to 7 m. an hour, and just under the surface of the water, although when alarmed it swims with greater velocity, strik-

ing the water upward and downward with its tail with great force. The pectoral fins are small, and seem scarcely if at all to aid in progression, which is accomplished by the large and powerful tail-fin. The tail-fin is very broad, and is divided into two lobes, called by South Sea whalers *the flukes.*

The enormous head of the C. is in great part occupied by a cavity in front of and above the skull, called by whalers *the case,* which is a receptacle for spermaceti (q.v.). This substance being light, it is not wonderful that the animal in swimming raises its head above the surface of the water, which it also often does even when at rest, "like a black rock in the ocean." The *case* frequently holds as much as ten large barrels of spermaceti. It is not formed of bone, but of a strong tendinous integument, and is divided into compartments communicating with each other. The substance which it contains is in a semi-fluid state, but hardens on cooling: it consists of spermaceti and oil; the oil is separated by draining and squeezing, and the spermaceti further purified, till, instead of being a yellow unctuous mass, in which state it is brought home by the whalers, it assumes a beautiful pearly white, flaky, almost crystalline appearance. When the spermaceti whale is killed, and towed alongside the whaling-ship, the *case* is emptied of its valuable contents through a hole made in front of the muzzle, and by means of a bucket attached to a pole. The spermaceti was at one time imagined to be the brain of the whale; what purpose it serves in the animal economy, is not well known, except that already alluded to of giving buoyancy to the forepart of the huge body; and perhaps this is its chief use, respiration even more than progression depending on it; but it is distinct enough from the brain, which is comparatively very small, and is indeed, as well as the skull which contains it, small in proportion to the whole bulk of the creature. Cavities filled with spermaceti are distributed over the body, and even ramify through the external fat or blubber, although the principal mass is in the head. The blubber of the C. is not nearly equal in thickness to that of the Greenland whale, being only about 14 in. thick on the breast of a large whale, and from 8 to 11 in. on other parts of the body. It is called by whalers the *blanket,* is removed from the body of the captured whale in great strips, and is heated in large pots, the skin of the whale serving for fuel, when the oil known as sperm oil (q.v.) flows from it. The *junk,* a thick elastic mass, which occupies the forepart of the head, immediately under the *case,* yields also a considerable quantity of sperm oil.

The C. feeds upon fishes and cephalopodous mollusks. Squids and cuttle-fishes appear to be its chief food. It is gregarious in its habits, and the herds are called *schools* by whalers. Five hundred or more have been seen in a single herd. Large herds generally consist of females, with only a few males; herds of young males also occur; when solitary individuals are met with, they are almost always old males. Terrible conflicts often take place among the males, and it is not unusual to find the lower jaw deformed in consequence of having been dislocated or broken in them. See Whale-fishery.

CACIQUE', or Cazique', the designation given to the chiefs of Indian tribes in works relating to the central and southern parts of America. The word was derived by the Spaniards from the language of the former inhabitants of St. Domingo.

CACODÆ'MON. See Demon.

CA'CODYLE, or Ka'kodyle, is an organic substance containing carbon, hydrogen, and arsenic (C_4H_6As). It has been proposed to employ the oxide of C. (C_4H_6AsO) as a deadly agent in war. This compound, otherwise known as *Cadet's fuming liquor* or *alkarsine,* has the remarkable property of taking fire spontaneously when exposed to the air, and evolving abundant fumes of arsenic. Thus, a shell filled with it would, on bursting, saturate a space of ground, or the rigging or deck of a man-of-war, with a liquid which would quickly take fire of its own accord, and besides causing destruction by burning, would likewise spread death by its fumes.

CACON'GO, or Mallem'ba, an independent state of s. Guinea, Africa, extending along the s. Atlantic ocean, in lat. 5° s., and stretching s.e. as far as the river Bell. Its limits interiorly are not well defined. The country is generally flat, and the soil fertile. The principal towns are Kinguele, and Cacongo and Mallemba on the coast, the last once a great mart for slaves.

CAC'TEÆ, or Cacta'ceæ, a natural order of exogenous plants, consisting of succulent shrubs of very singular appearance. Linnæus included all the C. in the single genus *cactus,* which is now divided into a number of genera; the name *cactus,* however, still continuing in popular use, common to the whole order. Nearly 500 species are known, but the real number is probably much greater. The C. are, without exception, natives of America, and their extraordinary forms constitute a remarkable feature in the vegetation of its warmer regions. All of them have fleshy stems, either simple or branched, often very soft and juicy; but in many, at least when old, having an easily distinguished woody axis, composed of annual rings, and covered with a layer of inner bark, so that the thick fleshy part may be regarded only as a layer of bark. Most of them are leafless; the *pereskiæ* alone have true leaves, which are fleshy; and the *opuntiæ* have rudimentary leaves, which soon fall off; but, instead of leaves, most of the order have clusters of hairs or prickles, where buds are formed in their stems, and these are

very numerous, even in the species which in ordinary circumstances most rarely develop branches. The multiplicity of curious forms exceeds imagination; in many species (*melocactidæ*, or melon thistles), the stem swells out into a globe; in others (*torch thistles*), it rises up as a column with many angles; in others (*opuntiæ*, Indian figs, or prickly pears), it divides in leaf-like articulations; in some (*pereskiæ*) it assumes a tree-like form, in which the thick stem bears a head of branches, and reaches a considerable height, sometimes even 30 or 40 feet. Those which have angular, ribbed, and channeled, or flat and two-edged stems, show a tendency to the cylindrical form as the stem advances in age. Some species have long creeping or trailing stems. The whole organization of the C. adapts them for the endurance of long droughts; they vegetate vigorously during a part of the year, and then rest; the very absence of leaves concurring with the absence of pores or *stomata* in their tough skin to enable them to resist the action of a dry atmosphere and powerful sunshine, and to occupy arid soils and bare rocks, on which they are very generally found, often covering large tracts. Some of them grow rapidly on old lavas, and disintegrate them by their penetrating roots, thus preparing a soil for other plants; and the prickly pear is often planted in Sicily by the mere insertion of a branch or joint of it in a fissure of lava. Many species occur as *epiphytes* (q.v.) on the trees of American forests. Some also grow on high mountains, a few even reaching almost to the border of the snow. The plants of this order are a great boon to the regions in which they chiefly abound, which are, at least during great part of the year, very destitute of water; their stems containing a store of insipid and wholesome juice, of which both men and cattle avail themselves.—Some species, as the prickly pear (q.v.), produce a pleasant fruit.—The fruit of *opuntia tuna* affords a valuable pigment of the richest carmine color.

The flowers of the C. are in general very short-lived; those of some night-flowering species, as of *cereus grandiflorus*, well known in our hothouses, endure only for part of a single night. In the greater number, they are large and splendidly colored, in some they are very fragrant. The order is regarded as botanically allied to *mesembryaceæ* (q.v.) and to *grossulariaceæ* (q.v., gooseberry, currant, etc.).

The cultivation of the C. in green houses and hothouses has been much in fashion for more than 30 years. The gardener must imitate the natural conditions of their growth, by giving water freely during a few months, and withholding it almost entirely during the rest of the year. Most of them are easily propagated by branches, taken off, and allowed to dry a little before being planted. The *melocactidæ*, which do not readily produce branches, are made to do so by cutting off or burning out the central bud, that the means of propagating them may be obtained.

CACTUS. See Cacteæ, *ante*.

CACUS, in legend, a gigantic son of Vulcan, who dwelt in a cave on mount Aventine and continually vomited fire and smoke. He stole cattle from the people and drew them backward into his cave, so that their tracks would not point to his abode. He was slain by Hercules for stealing the cattle of Geryon.

CADAM'BA, or Kudumba, the wood of several species of *nauclea*, a genus of trees of the natural order *cinchonaceæ*, natives of the East Indies, having flowers with a funnel-shaped corolla. *N. cadamba* is a noble tree, with orange-colored fragrant flowers, collected in heads about the size of a small apple. The leaves are from 6 to 10 in. long. The wood is yellow, soft, and fine-grained. The tree is highly prized for the shade which it affords; the wood is used for various purposes. *N. cordifolia* is a large tree, plentiful in mountainous districts of Hindustan; the wood yellow, close-grained, and used for flooring-planks, packing-boxes, and many other purposes, as is also that of *N. parviflora*. All kinds of C. wood are, however, liable to be injured by moisture, and can only be used where they are to be kept dry.

CADA MOSTO, Luigi da, a Venetian navigator of the 15th c., who, with others, in 1455, explored the w. coast of Africa as far south as the river Gambia. He wrote an account of his voyages in the *Book of the First Voyage over the Ocean to the Land of Negroes in Lower Ethiopia.*

CADASTRAL SURVEY is one which represents objects in their true relative positions and dimensions, as they exist on the face of the country, differing thus from a topographical survey, which, for distinctness, enlarges certain objects, as the dimensions of houses, width of roads, streams, etc. The usual scale of a map of C. S. is about 2 ft. to a mile.

CAD'DICE, or Cad'dice-Fly (*phryganea*), a Linnæn genus of insects of the order *neuroptera*, a family in subsequent entomological systems, and constituted by Mr. Kirby into a distinct order, *trichoptera* (Gr. hairy-winged). The caddice-flies certainly differ in important particulars from the other neuropterous insects, and exhibit points of resemblance to the *lepidoptera*. They have no mandibles, and the maxillæ and lower lip are membranous and united; the head is small, with prominent eyes, and two additional small simple eyes situated on the forehead; the antennæ are long and bristle-like, composed of very numerous indistinct joints. Both wings and body are generally very hairy, and the wings, when at rest, are raised, and meet above the back like those of butterflies, from which, however, they differ very much in form, being much more

elongate: the legs are long. Caddice-flies are extremely active, particularly in the evening and at night, when the smaller species often fly in great numbers above streams and ponds. These insects are most interesting, however, on account of their larvæ, of which the larger kinds are the well-known *caddice-worms*, or *cad-bait* of anglers. They are of a long, almost cylindrical form, the head and first three segments hard, the remainder —the abdominal segments—soft. To the thoracic segments are attached the feet, six in number, as in the perfect insect. The larva lives always in water, feeding on aquatic vegetables. It spins by its mouth silken threads, by means of which, together with a viscid substance, it attaches together—and often in a very symmetrical manner, and with interesting peculiarities which differ in the different species—small hard substances, such as small stones, bits of stick, or small shells, even although they happen to contain living inmates, and thus constructs a case for itself, in which its soft body is protected, and from which only the head and hard thoracic segments are voluntarily protruded. When it changes into the pupa state, in which it differs little from the perfect insect, except in the imperfectly developed wings, it fixes its case to some solid substance beneath the water, and closes the two extremities with a kind of grating, which admits the free passage of water, necessary for respiration. Before assuming the perfect form, the pupa of the larger species breaks out of its case by means of a pair of hooks on the forepart of the head, and swims actively by means of the hind legs, or crawls by the other two pair. Many of the smaller species bring their pupa case to the surface of the water, and there take wing from it as from a boat. The species of caddice-fly are very numerous, and they are said to be more so in the n. than in the s. of Europe. About 200 British species have been described.—The angler looks for cad-bait about the edges of streams and under stones, or on the stalks of water-cresses, and other aquatic plants. As a bait for angling, the caddice is almost as deadly as the May-fly, and more so, in clear running streams, than the ordinary worm; the usual-sized bait-hook is used, upon which two of the baits are fixed, the angler proceeding exactly as in ordinary worm-fishing.

CADDO, a parish in n.w. Louisiana, bordering on Arkansas and Texas; 1200 sq.m.; pop. '80, 26,305—19,383 colored. Productions, corn, cotton, sweet potatoes, etc. The Texas Pacific railroad passes through the parish. Principal town, Shreveport.
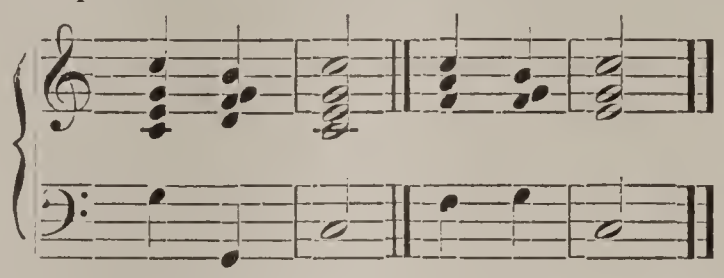
CADDOES, or Cadodaquios, Indians in or near Texas on the upper Red river and lake Caddo. There are but a few hundreds left of a once large tribe.

CADE, Jack, a historical character, leader of an insurrection which broke out in Kent, June, 1450. Little is known of his personal history, further than that he was an Irishman, and an illegitimate relation of the Duke of York, and hence called himself Mortimer. With 15,000 or 20,000 armed men of Kent, C. marched on London, and encamped at Blackheath, whence he kept up a correspondence with the citizens, many of whom were favorable to his enterprise. The court sent to inquire why the good men of Kent had left their homes; C., in a paper entitled "The Complaint of the Commons of Kent," replied that the people were robbed of their goods for the king's use; that mean and corrupt persons, who plundered and oppressed the commons, filled the high offices at court; that it was "noised that the king's lands in France had been aliened;" that misgovernment had banished justice and prosperity from the land; and that the men of Kent were especially ill-treated and overtaxed, and that the free election of knights of their shire had been hindered. In another paper, called "The Requests by the Captain of the Great Assembly in Kent," C. demanded that the king should resume the grants of the crown, which he complained the creatures about the royal person fattened on, the king thus being compelled to live on taxation; that the false progeny of the duke of Suffolk should be dismissed; and that the duke of York and others should be restored to favor, and a number of persons punished. The court sent its answer in the form of an army, before which C. retreated to Sevenoaks, where he awaited the attack of a detachment, which he defeated. The royal army now objected to fight against their countrymen; the court made some concessions, and C. entered London on the 3d July. For two days, he maintained the strictest order; but he forced the mayor and judges to pass judgment upon lord Say, one of the king's hated favorites, whose head C.'s men immediately cut off in Cheapside. On the third day, some houses were plundered, the leader himself, it is said, setting the example. C., who at night lodged his army in the borough, got news that the citizens intended to prevent his entrance into the city on the morrow, and in the night he made an attack on the bridge, but was defeated. A promise of pardon now sowed dissension among his followers, who dispersed, and a price was set upon C.'s head. He attempted to reach the Sussex coast, but was followed by an esquire, named Alexander Iden, who fought and killed him, July 11. His head was stuck upon London bridge, as a terror to traitors.

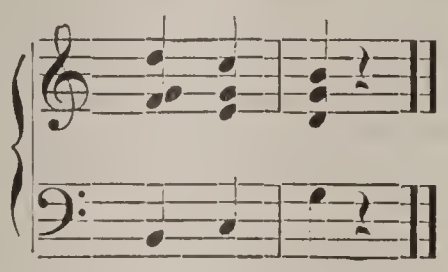
CADELLE', *trogosita mauritanica* or *caraboides*, an insect sometimes found in granaries in Britain, but seemingly imported from more southerly countries, where, as in France, its larvæ often commit great ravages among stored corn. They also live on bread, almonds, and even rotten wood. When full grown, they are about ¾ of an in. long, flattened, fleshy, rough with scattered hairs, whitish, tapering towards the head; which is black, horny, and furnished with two curved jaws. The perfect insect is a glossy beetle of a deep chestnut color, marked with dotted lines. It belongs to the

family of *xylophagi*, of the order of *coleoptera* (q.v.), section *tetramera*. The name C. is French.

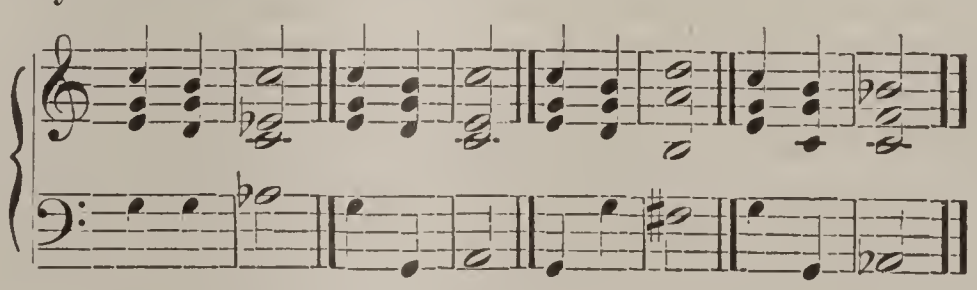
CA'DENCE, in music, is the finish of a phrase (in German, *schluszfall*), of which there are three principal species—viz., the whole, the half, and the interrupted cadence. The whole C., which finishes on the harmony of the tonic, is also called the perfect C., and is always used at the end of a composition, and frequently called the final cadence. In its most perfect use, it consists of three chords—the one before the final being always the dominant. as for example:



The half C., also called the imperfect C., is used to mark the termination of an idea or phrase, like the colon and semicolon; showing a considerable division, but at the same time that a continuation is necessary. The harmony of the half C. is the reverse of the whole C., as it falls from the tonic to the dominant, and sometimes to the sub-dominant as follows:



In the interrupted C. (Ger. *trugschlusz;* Ital. *cadenza d'inganno*), the preparation for the ordinary perfect C. is made; but instead of the harmony of the tonic following the dominant, another harmony quite strange is introduced, so that the ear is deceived. The more particular the preparation for the usual C. is made, the more strange and unexpected is the interruption, which can be made in so many ways that Reicha, in his *Traité de Haute Composition Musicale*, gives 129 interrupted cadences. The following are those generally in use:



CADENCY (from Lat. *cado*, to fall or decline). The marks by which the shields of the younger members of families are distinguished from those of the elder, and from each other, is an extensive. and, in so far as that term can be applied to heraldry at all, an important branch of the science. No distinction is usually made by writers on heraldry, and probably the practice of heralds in general scarcely admits of any being made, between *marks of C.*, *differences*, *distinctions*, or even *brisures*, though the last term is pretty constantly and quite appropriately used to include not only differences in general, but also abatements (q.v.) or bearings by which the arms of the family are broken or diminished. See Bastard Bar. But there is a manifest convenience in the practice which is usually followed in Scotland, of appropriating the label, the crescent, the mullet, and the rest of the series of marks, commonly known as marks of C., to the purpose of distinguishing the sons from the father, and from each other, during the father's life-time; and of adopting other distinctions—such as the bordeur of various kinds, the chief engrailed, embattled, and the like, as differences between the coats of brothers, after the death of their father, and of the houses descended from them. Another very common mode of differencing the shields of brothers in early times, was by changing the tinctures; but this is now regarded as too extensive a change for such a purpose.

The differences at present used by the royal family will be found in most of the peerages. The rule with regard to them seems to be that, unlike subjects, they all bear the label of three points argent; but the label of the prince of Wales is plain, whilst those of the other princes and princesses are charged with crosses, fleurs-de-lis, hearts, or other figures, for the sake of distinction. One of the most frequent reasons for matriculating the arms of the younger branches of families of distinction in the lord Lyon's register, is that they may be properly distinguished from those borne by the head of the house.

CADEN'ZA, in music, an ornamental succession of notes introduced at pleasure by the performer at the finishing of a phrase.

CADER IDRIS (chair of Idris, a reputed giant), a picturesque mountain in Merionethshire, Wales, 5 m. s.s.w. of Dolgelly. It consists of an immense ridge of broken precipices, 10 m. long, and 1 to 3 m. broad; the highest peak reaching an elevation of 2914 feet. It is composed of basalt, porphyry, and other trap rocks, with beds of slag and pumice. The view from the summit, which is very extensive, includes the Wrekin in Shropshire, and St. George's channel almost to the Irish coast.

CADET (*ante*). All students at the United States military academy and naval academy have this title; and there are also medical cadets recognized as a distinct rank.

CADET, Military (Fr. *cadet,* younger, junior in service—allied in derivation and meaning to cadency (q.v.) in heraldry), is a term applied in a general sense to a junior member of a noble family as distinguished from the eldest; and in France, any officer junior to another is a C. in respect to him. In a strict military sense, however, a C. is a youth studying for the public service.

In England, military cadetship has presented two aspects, according as it is related to the East India company's or to the royal service. When the company possessed political and military authority in India, there were about 5000 English officers in their pay. Those who commanded the company's own regiments had been professionally educated by the company. A youth, nominated by the directors, was examined as to his proficiency in an ordinary English education, and admitted between the ages of 14 and 18 to Addiscombe school or college, near Croydon. If a probation of 6 months resulted satisfactorily, he entered upon a two years' course of study. If he passed through this ordeal well, he became a C. in the company's service, receiving pay or salary, and being available for service in India, as opportunity might offer. The system of Indian cadetship underwent various modifications by the introduction of competition in the appointments, and by the transference of the company's powers to the crown; and ceased in 1861, when the accession of fresh officers to the local Indian armies was stopped.

The second aspect of military cadetship in England, adverted to above, is that of the royal or queen's cadets. The arrangements in operation until recently will be found noticed under Sandhurst College; and the present arrangements are given under Staff College, and Military Academy, Royal.

CADET, Naval, is the lowest grade of officer in the royal navy. The cadets enter the royal service at 12 to 13½ years of age. Every captain, on being appointed to a ship in commission, is allowed to nominate one C.; every flag-officer (admiral, etc.), two, on hoisting his flag; each member of the board of admiralty, four; the two secretaries, two each; and all the rest are nominated by the first lord of the admiralty. The candidates are examined at the royal naval college at Greenwich; if they pass, they are sent for two years to the *Britannia* training-ship at Dartmouth, which is virtually a public school, for tuition, in which the C.'s parent or guardian pays £70 a year. If they do not progress sufficiently in the training-ship, they are rejected; but if the report is favorable, they are put into sea-going ships. While on board, the C. is expected to watch and learn as much as possible of what is going on—saluting officers, tying knots, splicing ropes, arranging rigging, learning technical terms, going aloft, keeping the log, keeping watch, etc. If he pass from the *Britannia* with a first-class certificate, he becomes a midshipman at once; otherwise, according to the progress he makes. Cadets mess with the midshipmen on shipboard. There were 191 cadets on the navy estimates for 1878–79, receiving each a shilling a day as pay or pocket-money.

CADETS' COLLEGE. A college with this designation was established in 1858 by a remodeling of the junior department of the royal military college at Sandhurst. Its objects were, to give a sound military education to youths intended for the army, and to facilitate the obtaining of commissions when the education was finished. The age of admission was between 16 and 19. The friends of a youth, able to pay the sums of money presently to be named, applied to the commander-in-chief for permission to place the youth on the list of candidates; this permission was usually granted on production of satisfactory certificates and references. The youth might go up for examination on any half-year. The list of subjects included English composition, continental languages, mathematics, history, geography, natural sciences, experimental sciences, and drawing. After the examination, the candidates were reported to the commander-in-chief in their order of merit. Those who had the most marks were admitted as cadets as soon as vacancies occurred in the college. When entered, they studied for two years on a great variety of subjects connected with military science and practice. The friend supplied clothing, books, and instruments. The annual payment for education, board, and lodging varied from £100 per annum down to £20; the highest sum being demanded for "the sons of private gentlemen," while the lowest was deemed sufficient for "the sons of officers of the army or navy who had died in the service, and whose families were proved to be left in pecuniary distress." Twenty of the youths were "queen's cadets," sons of officers "who had fallen in action, or had died from the effects of active service, and had left their families in reduced circumstances." These 20 cadets were

admitted and educated gratuitously. This system was abolished in 1870. Sub-lieutenants of cavalry and infantry, styled "student officers," who have done duty with a regiment for about 12 months, are now required to attend the college at Sandhurst, and go through a course of study for a year. At the end of it, on passing a satisfactory examination, they are promoted to the rank of lieutenant, and rejoin their regiments. See also MILITARY ACADEMY, ROYAL.

CADET'S FUMING LIQUOR. See CACODYLE.

CA'DI, an Arabic word signifying a judge or person learned in the law, the title of an inferior judge amongst the Mohammedan nations, who, like the Mollah (q.v.), or superior judge, must be chosen from the higher ranks of the priesthood, as all law is founded upon the Koran.

CADILLAC, ANTOINE DE LA MOTHE, d. 1719; a French pioneer and officer in America, who came to Nova Scotia in 1691; commanded at Michilimackinac, 1691–97, and in 1701 founded Detroit. He was governor of Louisiana, 1712–17, where he had much trouble with the Indians.

CAD'IZ, a province in s. Spain, in the ancient division of Andalusia; bounded n. by Seville, e. by the Mediterranean, s. by the straits of Gibraltar, and w. by the Guadalquivir; 2806 sq.m.; pop. '70, 426,499. It is a mountainous region, traversed by the Sierra Nevada, and but partially cultivated. The wines of the province are especially fine. The western part is traversed by the Seville and Cadiz railroad.

CAD'IZ (ancient *Gades*), an important commercial city of Spain, capital of the modern province of the same name, which forms a part of the great division of Andalusia; is situated at the extremity of the long narrow isthmus of the isle of Leon, in lat. 36° 32′ n., and long. 6° 17′ west. The Atlantic ocean washes its western and part of its southern side, and on the n. and n.e. it is inclosed by the bay of Cadiz, a deep inlet of the Atlantic, forming an outer and an inner bay. Connected by only a narrow strip of ground (in some places not above 200 yds. across) with the mainland, C. is admirably situated for defense; but though it has several sea and land fortifications, these are by no means considered impregnable. The town, which is surrounded by walls, forms nearly a square, each side being about a mile and a half in length. The houses being built of white stone, the city presents a remarkably bright and clean appearance from the sea. The streets are well paved and lighted, regular, but narrow, and there are some pleasant public walks, the most frequented of which is the Alameda. It has few public buildings of note; its two cathedrals are, on the whole, but poor specimens of ecclesiastical architecture, and its pictures, with the exception of one or two excellent pieces by Murillo, are of little value. C. declined greatly as a commercial city after the emancipation of the Spanish colonies in South America; but owing partly to the recent extension of the railway system in Spain, and partly to the establishment of some new lines of steamers, the trade has, within the last thirty years, revived considerably. Quite lately again there has been slight depression. In 1873, the total imports of C. were valued at £2,100,729; in 1881, at £3,861,000; in 1873, the exports were worth £3,941,095; and in 1881, only £3,630,000. The number of Spanish ships which entered C. in 1881 was 2751, with a tonnage of 722,865; of foreign ships, 1015—tonnage, 412,873. The exports consist of wine, olive-oil, fruits, salt, and metals, The manufactures are glass, woolen cloth, soap, hats, leather, etc. Pop. '79, 68,000.

C. is one of the most ancient towns in Europe, having been built by the Phenicians, under the name of Gaddir, 347 years before the foundation of Rome, or about 1100 B.C. It afterwards passed into the hands of the Carthaginians, from whom it was captured by the Romans, who named it Gades, and under them it soon became a city of vast wealth and importance. Occupied afterwards by the Goths and Moors, it was taken by the Spaniards in 1262. In 1587, Drake destroyed the Spanish fleet in the bay; nine years later, it was pillaged and burned by lord Essex; and in 1625 and 1702, it was unsuccessfully attacked by other English forces. After the revolution of 1808, C. became the headquarters of the insurrectionary junta, by whose orders it was separated from the mainland. The French, in Feb., 1810, commenced a blockade, which they vigorously persevered in, capturing several of the forts, until Aug. 25, 1812, when the victories of the duke of Wellington forced them to abandon it. The city was besieged and taken by the French in 1823, and held by them until 1828. In the Spanish revolution of 1868, C. played a distinguished part.

CADMIA is the term applied to the crust formed in zinc furnaces, and which contains from 10 to 20 per cent of cadmium.

CADMIUM is a metal which occurs in zinc ores, and, being more volatile than zinc, rises in vapor, and distils over with the first portions of the metal. See ZINC. C. is represented by the symbol Cd, has the atomic weight 56—new system, 112—and the specific gravity 8.6. It is a white metal, somewhat resembling tin; is malleable and ductile; fuses at 442° F., and rises in vapor a little above 600°. It is rarely prepared pure, and is not employed in the arts as a metal, though one or more of its salts have been serviceable in medicine. The sulphide of C., CdS, occurs naturally as the mineral *greenockite*, and when prepared artificially, is of a bright yellow color. It is known as cadmium yellow, and is of great value to the artist. A great variety of tints are pro-

duced by mixing it with white-lead. Much of what is sold as Naples yellow (q.v.) is thus prepared; but the genuine Naples yellow has a greenish tint, which renders it easily distinguishable from the imitation. Cadmium yellow, however, has many valuable qualities, which are causing it rapidly to supersede Naples yellow.

CADMUS (according to Apollodorus and others) was the son of Agenor and Telephassa, and the brother of Europa. When the latter was carried off by Zeus, he and his brothers, as also their mother, were sent in quest of her, with injunctions from Agenor not to return without her. Their search was vain, and the oracle at Delphi told C. to relinquish it, and to follow a cow of a certain kind which he should meet, and build a city where it should lie down. He found the cow in Phocis, followed her to Bœotia, and built there the city of Thebes, about 1550 B.C. The myth of C., however, like other early Greek myths, abounds in contradictions, and it is wholly impossible to disentangle the historical facts from the meshes of fable in which they are imprisoned. To him is ascribed the introduction into Greece of an alphabet of 16 letters, derived from Egypt or Phenicia, and the discovery of brass, or introduction of its use.

CADOUDAL, GEORGE, a distinguished leader in the Chouan or royalist war in Brittany, was b. near Auray, in lower Brittany, where his father was a miller, in 1771. He was among the first to take up arms against the republic, and soon acquired great influence over the peasants. Captured in 1794, he was sent as a prisoner to Brest, from which he soon made his escape, imprisonment having only increased his loyal ardor. Annoyed at the dissensions between the Vendean generals and the emigrant officers, and the disasters consequent thereon, C. organized an army in which no noble was permitted to command, and which Hoche, with all his great military talents, was unable to subdue or disperse. In 1799, C. was the soul of the conspiracy to overthrow the first consul, and place a Bourbon on the throne; but the events of the 18th Brumaire disarranged the plans of the conspirators. Bonaparte recognized C.'s energy and force of character, and offered to make him a lieut.gen. in his army, which offer C. refused, as well as another of a pension of 100,000 francs, if he would only consent to remain quiet. Bonaparte attempted to arrest him, but he fled to England; where, in 1802, he conspired with Pichegru for the overthrow of the first consul. With this design he went to Paris, but was arrested, condemned, and executed June 25, 1804. C. was a man of stern honesty and indomitable resolution. "His mind was cast in the true mold; in my hands he would have done great things," was Napoleon's estimate of him.

CADU'CEUS, the winged staff of Mercury, or Hermes, as he was called by the Greeks, which was supposed to give the god power to fly. The C. in the actual world was the staff or mace carried by heralds and ambassadors, from which circumstance, no doubt, it came to form one of the attributes of the messenger of the gods. Originally, it was simply an olive-branch, the stems of which were afterwards formed into snakes, in accordance with several poetical tales invented by the mythologists. One of these was to the effect that Mercury, having found two snakes fighting, divided them with his rod, and that thus they came to be used as an emblem of peace. Many miraculous virtues were ascribed to the caduceus. On the coinage of antiquity, the C. is often given to Mars, who holds it in the left hand, a spear being in his right, to show how peace and war alternate. It is also seen in the hands of Hercules, Bacchus, Ceres, Venus, etc. Amongst the moderns, the C. is used as an emblem of commerce, over which Mercury was the presiding divinity.

CADWALADER, GEORGE, b. Penn.; bred to the law; served as brig.gen. in the Mexican war and maj.gen. of volunteers in the war against the rebellion.

CADWALADER, or CADWALLADER, JOHN, 1743–86; b. Penn.; a member of the Pennsylvania convention of 1775, and brig.gen. in the revolutionary war, participating in the engagements at Brandywine, Germantown, Monmouth, and Trenton. After peace he was a member of the Maryland assembly.

CÆCIL'IA (Lat. *cæcus*, blind), a genus of reptiles, formerly placed among serpents, on account of their form, although, in their anatomical structure, peculiarities were observed allying them to batrachians, with which they are now ranked, the important fact having been ascertained of their breathing by gills when young, and undergoing a metamorphosis. The body is almost cylindrical or worm-like, the head small, the eyes very small, and nearly hidden by the skin; in some species, indeed, imperfect or wanting, upon which account the name C. was given to them, and an attempt has been made to transfer to them the English name blindworm, commonly given to the *anguis fragilis*. The skin is smooth, viscous, and annularly wrinkled, appearing naked, although, upon dissection, minute scales are found disposed between its wrinkles, at least in some species. The vertebræ are articulated as in fishes and in some of the other lower batrachians, not as in serpents, and the skull is united to the first vertebra by two tubercles. The ribs are imperfectly developed, and much too short to encircle the trunk.—The original genus C. has been subdivided, now forming a family, *cæciliadæ*. The species are inhabitants of warm climates, and of marshy or moist places.

CÆCIL'IUS STATIUS, d. 168 B.C.; a Roman comic poet and dramatist, of whose works few fragments remain. The people ranked him with Plautus and Terence, as among the first of comic writers.

CÆ'CUM (Lat. *cæcus*, blind), a blind sac; that is, a sac or bag having only one opening, connected with the intestine of an animal. In man there is only one C., very small, and apparently not performing any important function, situated at the extremity of the small intestine, where it terminates in the large intestine or colon. In many of the mammalia, however, and particularly in most of those which are herbivorous, it is comparatively large, and is found to secrete an acid fluid resembling the gastric juice. It therefore appears that, where the nature of the assimilatory process is such as to require the detention of the food for a considerable time, this provision is made for it, in order that digestion may be more completely accomplished. The C. is entirely wanting in some quadrupeds, as in bats, and the bear and weasel families. Birds have two cæca, which are generally long and capacious in those that are omnivorous or granivorous, and the position of which is the only circumstance that marks the division of the intestine into two parts, the small and the large intestine, or the *ileum* and the *colon*. In reptiles, a C. is of very rare occurrence. Fishes have none in the position occupied by those of quadrupeds and birds, but many of them have cæca attached to the intestine at its uppermost part, and very generally regarded as appendages of the stomach. The number of these cæca is, however, extremely various; sometimes there are only 2, and sometimes more than 100. The number is different even in very nearly allied species of the same family; thus, there are only 6 in the smelt, but 70 in the salmon; 24 in the herring, and 80 in the shad. In some fishes, as the cod, the cæca consists of large trunks ramified into smaller ones.—The intestinal canal of some of the *infusoria* is furnished throughout its whole length with numerous cæca, no other organ corresponding to a stomach appearing to exist.

CÆDMON, the first Anglo-Saxon writer of note who composed in his own language, and of whom there are any remains. The date of his birth is unknown, but his death occurred about 680 A.D. He was originally a cowherd attached to the monastery of Whitby, and, according to Bede, "even more ignorant than the majority of his fellows, so that in the evenings, when the domestics assembled in the hall to recreate themselves with music after the labors of the day, C. was frequently obliged to retire in order to hide his shame when the harp was moved towards him." One night, however, as he was sleeping in the stable loft, a stranger appeared to him, and commanded him to sing. C. declared his ignorance, but the stranger would take no refusal, and imposed on the poor cowherd the sublime task of hymning the glories of creation. Suddenly a poetic inspiration seized him, and he began to pour forth verses. When he awoke from his dream the words remained fast-rooted in his memory, and were recited by him to others with new confidence. The abbess Hilda, and the learned men who were with her in the monastery, immediately declared that he had received the gift of song from heaven. He was now educated, became a monk, and spent the rest of his life in composing poems on the Bible histories and on miscellaneous religious subjects, many of which nave been preserved, and are altogether in bulk nearly equal to the half of *Paradise Lost*, to parts of which some of them bear a striking resemblance. Satan's speech in hell is characterized by a simple yet solemn greatness of imagination, which may possibly have influenced at some period of his life the more magnificent genius of Milton.

CÆLATU'RA. See CHASING.

CÆ'LIUS AURELIA'NUS, a physician of Numidia in the latter days of the Roman empire, and author of a valuable medical work. He divided disease into two great classes, acute and chronic, devoting his work of ten books to their elucidation.

CÆLIUS MONS, one of the seven hills of Rome. See ROME, *ante*.

CAEN, the chief t. in the department of Calvados, France—formerly the capital of lower Normandy—is situated on the left bank of the Orne, about 9 m. from its mouth, 122 m. w.n.w. of Paris. C. is built in the middle of a fertile plain; its streets are wide and clean, it has several fine squares, and many noble specimens of ancient Norman architecture. Among the best examples are the churches of St. Etienne, founded by William the conqueror, and which contained his monument, erected by William Rufus, and destroyed by the Huguenots in 1562; La Trinité, called also *Abbaye aux Dames*, founded by Matilda, wife of the conqueror; St. Nicholas, now a cavalry fodder-store; St. Pierre and St. Jean. The castle, founded by the conqueror, and finished by Henry I. of England, was partially destroyed in 1793. There are several beautiful promenades in the city, which has manufactures of lace, blonde, crape, cutlery, cotton-yarn; breweries, dye-works, wax-bleaching, and ship-building yards. Its Angora gloves, made from the unwashed, undyed fur of Angora rabbits, which are reared in the district, are celebrated. Quarries in the neighborhood produce an excellent stone, called Caen stone (q.v.). Trade is facilitated by a maritime canal connecting the port with the sea, and also by the railway connecting it with the Paris and Rouen line; those to Cherbourg, Tours, and Honfleur, and that to Flers, opened in 1867, which affords C. communication with Granville. Nothing is known of C. before the 9th century. It was a place of importance in 912, when it came into the possession of the Normans, under whom it increased rapidly. William the conqueror and his queen made it their residence, and greatly improved it. In 1346, it was taken and pillaged by the English, who again captured it in 1417. It was held by them until 1450, when the French compelled them to surrender.

During the revolution of 1793, several of the Girondist chiefs, proscribed by the Jacobins, went to C., and organized a revolt against the Mountain, which proved unsuccessful. Pop. '76, 33,072.

CAEN STONE. The neighborhood of the t. of Caen, in Normandy, has been celebrated for its stone quarries from a very early period. The excellence of the stone, and the facility of transport by sea, led to C. S. being very extensively used in England in the 15th and 16th centuries. In 1460, the abbot of Westminster obtained a license to import C. S. for the repairs of the monastery. Later, it became a regular article of importation, and in 1582 it is rated at the custom-house at 6*s.* 8*d.* the ton. Winchester and Canterbury cathedrals, Henry VII.'s chapel at Westminster, and many country churches, are built of C. S., which is still frequently used in England. The stone is an oolite, resembling Stonesfield slate, but without its slaty structure. The quarries are subterraneous, and the stone is brought up through vertical shafts in blocks 8 or 9 ft. long, and about 2 thick.

CÆRE. See CERVETERÉ, *ante.*

CAERLE'ON (Castle of the Legion), a small but ancient t. in Monmouthshire, on the right bank of the Usk, 2 m. n.e. of Newport. It is the Isca Silurum of the Romans, and is supposed to have been the capital of the Roman province Britannia Secunda, now Wales, and the residence of the famous king Arthur. It was the seat of an ancient archbishopric, which was removed to St. Davids about 519 A.D. An abbey of Cistercian monks existed here before the reformation. C. was an important place in the 12th c., but it was afterwards ruined by the frequent wars between the Welsh and Anglo-Saxons. Many Roman relics have been found here, as aqueducts, baths, pavements, altars, tiles, coins, inscriptions, and statues; many of the smaller antiquities are deposited in a museum in the town; besides half-melted ore and cinders, and the remains of a fortress, with walls 12 ft. thick and 1800 yards long, and of an amphitheater, called king Arthur's round table, 222 by 192 ft. in size. Pop. '71, 1306. The chief occupation is the manufacture of tin-plates.

CAERMAR'THEN (Welsh, *Caer Fyrddyn*, the *Maridunum* of Ptolemy), a seaport t., capital of Caermarthenshire, South Wales, on the right bank of the Towy, 9 m. from Caermarthen bay. It lies in a picturesque situation, but the streets are irregular, steep, and often narrow. The Towy is navigable for vessels of 200 tons up to the town, and salmon and sewin are caught in the river. There are tin and iron works near the town. C. exports tin-plates, cast iron, timber, marble, bark, slates, lead ore, bricks, grain, butter, and eggs. The Welsh language is used in most of the churches. C. is a co. borough, having a separate jurisdiction from the shire. It unites with Llanelly in returning one member to parliament. Pop. '81, 10,512. There is a college for Welsh teachers. Near C. are the remains of two Roman camps. In the 5th c., Merlin, the Welsh prophet, is said to have been born here. It was long the residence of the native princes of South Wales. Caermarthen castle often changed hands in the contests of the Welsh chiefs with each other, and in the subsequent wars with the Saxons and Normans.

CAERMAR'THENSHIRE, a maritime co. in South Wales, on the Bristol channel; bounded n. by Cardigan, from which it is separated by the Teify; e. by Brecknock; s. by Glamorgan and Caermarthen bay; and w. by Pembroke. It is the largest of the Welsh counties; length, 53 m.; greatest breadth, 33 m.; area, 974 sq.m., nearly a third of which is waste. The county is mountainous in the n. and e., and is characterized by productive though narrow valleys and deep, wooded glens. Caermarthen Van or Beacon rises to the height of 2596 ft., being the greatest elevation in the county. The coast of C. is marshy, and is all situated on Caermarthen bay, which washes also small portions of the coasts of Glamorgan and Pembroke, is 17 m. across, 10 m. deep, 35 in circuit, and receives the rivers Taff or Tave, Towy, and Lhoughor. The chief rivers of C. are the Towy, Cothy, Taff, and Teify. The Towy has a course of 60 m., of which 50 are in Caermarthenshire. It yields plenty of salmon, sewin, trout, eels, and lamprey, and is navigable for the last 9 m. of its course. On this river is the celebrated vale of the Towy, 30 m. long, with an average breadth of 2 miles. C., n. and w. of the Towy, comprising three fourths of the county, consists of lower Silurian clay-slate and grauwacke. In the s.e. corner of the county is a band of carboniferous limestone and grit, to which succeeds a small part of the South Welsh coal-field of Glamorgan and Monmouth, chiefly composed of stone-coal and culm. The mineral productions of the county are iron, coal, copper, lead, slates, lime, dark-blue marble. These, with tinned iron, grain, cattle, horses, sheep, and butter, are exported. The climate of C. is mild, but moist; the soil is stiff and poor in the uplands, affording pasturage for small cattle; but the rest of the county is well wooded, and in the s. part along the rivers very fertile. Oats and barley are the chief crops. The chief towns are Caermarthen (the county town), Llanelly, Llandeilo-vawr, Llandovery, Newcastle-in-Emlyn, and Kidwelly. The chief manufactures are woolens and hides. Pop. '81, 124,861. C. sends two members to parliament. The county contains so-called Druidical remains and Roman roads, besides many baronial and ecclesiastical ruins. In this county originated the "Rebecca" riots, which in South Wales, in 1843–44, were directed against the turnpike-gates.

CAERNAR'VON (*Caer-yn-ar-Fon*, Fort opposite Mon or Anglesea), a parliamentary and municipal borough and seaport in North Wales, the capital of Caernarvonshire, situated near the s. end of the Menai strait, on the right bank of the Seiont, 245 m. n.w. of London. C. has a castle situated at the w. end of the town, the building of which was commenced by Edward I. in 1284. It is one of the noblest ruins in the kingdom, the walls being still entire, and inclosing an oblong of three acres. The walls are 7 to 9 ft. thick, and are pierced by a covered gallery, with loop-holes to discharge arrows. There are thirteen embattled towers, with five, six, or eight sides, and surmounted by turrets. The gateway under the great square tower has four portcullises. The town itself was once surrounded by walls and round towers. These walls, with several of the gates, still exist, but are now within the town. The streets are narrow, but regular, and at right angles to each other. In the churches and chapels, the services are in Welsh and English. C. unites with Pwllheli, Nevin, Criccieth, Conway, and Bangor in returning one member to parliament. In 1880, 2256 vessels with a burden of 149,706 tons, entered, and 2389 vessels, with a burden of 172,021 tons, cleared the port, chiefly small-craft and steamers to and from Liverpool. The harbor admits of ships of 400 tons. The chief exports are copper ore, coal, and slates. There is also a great iron and brass foundry. C. is a bathing place, and is much frequented by tourists, on account of its vicinity to the grandest scenery in North Wales. Many families of the upper ranks reside in and around the town. Pop. '81, 10,237. Half a mile from C. are the remains, covering seven acres, of Segontium, or Caer Seiont, a Roman station or city. Gold, silver, and copper coins and ornaments, and other Roman relics, have been found here. There is a Roman fort on the left bank of the Seiont, still almost complete, with walls 11 ft. high, and 6 ft. thick, and with parallel rows of holes 3 in. in diameter. C. was the seat of the native princes of North Wales down to 873. In 1284 was born here the first Anglo-Norman prince of Wales, afterwards the unhappy Edward II. In 1294, the town and castle were burned, and the English inhabitants massacred by the Welsh under Madoc, the illegitimate son of Llewelyn, a native prince of Wales. From a rocky height near Uxbridge hotel, there is a fine view of Snowdon and the island of Anglesea.

CAERNAR'VONSHIRE, a maritime co. in North Wales, bounded n. by the Irish sea; e. by Denbigh, with the Conway between; s. by Merioneth and Cardigan bay; and w. by Caernarvon bay and the Menai strait, the latter separating it from Anglesea. It is 51 m. long; greatest breadth, 22 m.; average, 9; area, 544 sq.m., of which $\frac{1}{2}$ is in pasture, and only $\frac{1}{40}$th in tillage. The surface is mountainous, and is traversed by the grandest and highest ranges in South Britain, and it is the highest and most mountainous county in North Wales. The Snowdonian or chief range runs through the middle of the greatest length of the county, from s.w. to n.e., and is very bold and rocky. It attains the greatest elevation in Snowdon (q.v.), 3571 ft., in the center of the county, and the highest mountain in South Britain. Caernarvon bay is 30 m. across, 15 long, with 2 to 30 fathoms water, and communicates with the Irish sea through the Menai strait, which is 17 m. long, and $\frac{1}{3}$ to 4 m. broad. The rivers of C. are numerous, but small, from the nearness of all parts of the county to the sea. The Conway, navigable for 10 m., which runs along the e. border, is the chief. Almost all the streams flow through small lakes or tarns—of which there are 50 or 60 in the county—around the central or Snowdonian group of mountains. There are many fine cataracts on these streams. The mineral products of C. are copper, lead, zinc, coal, roofing and writing slates, slabs, chimney-piers, honestone. The slate quarries employ many thousands of workmen. The climate is mild in the peninsular part of C., but severe among the hills. The chief branch of rural industry in C. is the rearing of black cattle for the dairy, and of small sheep. Wheat, oats, barley, and potatoes are raised in the valleys. Pop. '81, 119,195. The chief towns are Caernarvon (the county town), Bangor, Pwllheli, Conway, Nevin, and Criccieth. In addition to the above boroughs, several flourishing towns have recently sprung into existence in the county—Llandudno, Tremadoc, and Bethesda being the principal. It returns two members to parliament—one for the county, and one for the six chief towns. Connected with C. is the Chester and Holyhead railway, on the great route from London to Dublin, which crosses into Anglesea by the Britannia tubular bridge over the Menai strait. C. contains the remains of British or Celtic camps and hill-forts, especially around Snowdon, several dolmens and stone circles, and some ancient castles. The Snowdonian mountains were long the stronghold of the Welsh against the Romans, Saxons, and Normans in their efforts to subjugate Wales, and here the Welsh were at last defeated in 1283 by Edward I.

CÆSALPI'NIA, a genus of trees of the natural order *leguminosæ* (q.v.), the type of the sub-order *cæsalpinieæ*. This sub-order is characterized by irregular flowers, which are not papilionaceous (q.v.), and contains upwards of 700 known species, among which many are notable for their purgative properties, as senna (q.v.); some produce eatable fruits, as the tamarind (q.v.), the carob (q.v.), and the West Indian locust tree (q.v.); some yield resinous and balsamic products, as copaiva (q.v.), aloes-wood (q.v.), etc.; some produce important dye-woods, as logwood (q.v.), Brazil wood (q.v.), camwood (q.v.), etc.; and some are trees of great size, and very valuable for their timber, as the purple-heart (q.v.) and the wallaba (q.v.), trees of Guiana. No species of the sub-order

is British, and it generally belongs to warm climates.—The genus C. contains a number of species, trees with pinnate or bipinnate leaves, natives of the warm parts of Asia and America, which yield the Brazil wood, Pernambuco wood (see BRAZIL WOOD), and sappan wood (q.v.) of commerce, also the astringent pods called dividivi (q.v.), used in tanning.

CÆSALPI'NUS, or CESALPINO, ANDREAS, 1519–1603; an Italian philosopher of whose family or descendants nothing is known. He first appears as professor of botany in the university of Pisa, where he seems to have studied, and perhaps taught, anatomy and medicine. In his first work, *Speculum Artis Medicæ Hippocraticum*, he left proof, in a passage often quoted, that he had a clear idea of the circulation of the blood, at least through the lungs. In botany he was more original, and his works are highly philosophical and valuable, being a rich mine from which Linnæus, Morrison, and others took their ideas of botanical arrangement. He died in Rome in attendance upon pope Clement VIII.

CÆSAR, the name of a patrician family of the *Julia Gens*, one of the oldest in the Roman state, claiming to be descended from Iulus, the son of Æneas. When or from what cause the surname of C. was first acquired, is in the highest degree uncertain. Spartianus, in his *Life of Ælius Verus*, mentions four different opinions respecting its origin: 1. That the word signified an elephant in the language of the Moors, and was given as a surname to one of the Julii because he had killed an elephant; 2. That it was given to him because had been cut (*cæsus*) out of his mother's womb after her death; 3. Because he had been born with a great quantity of hair (*cæsaries*); or, 4. Because he had azure-colored eyes (*cæsii*). The opinion to which we most incline is the third of these, but who was the original "shock-head" of the gens we cannot say; the first, however, mentioned in history is Sex. Julius Cæsar, prætor in 208 B.C. The greatest individual of the family, and one of the greatest men the world has ever seen, was

CÆSAR, CAIUS (or rather GAIUS) JULIUS, son of a Roman prætor of the same name, was b. 12th July, 100 B.C. Two circumstances conspired to determine his sympathies in favor of democracy, and against a republican oligarchy: the first was the marriage of his aunt Julia with Caius Marius; the second, the marriage of C. himself, in 83 B.C., with Cornelia, daughter of L. Cinna, one of the principal enemies of Sulla. The anger of the dictator at this cost C. his rank, property, and almost his life itself. Feeling that he would be safer abroad for a time, he went to Asia, 81 B.C.; but on learning of the death of Sulla (78 B.C.), he hurried back to Rome, where he found the popular party in a state of great ferment, and anxious to regain what it had lost under the vigorous despotism of the aristocractic dictator. C., however, took no part in the attempts of Lepidus to overthrow the oligarchy; but he showed his political leanings by prosecuting (77 B.C.) Cn. Dolabella—a great partisan of Sulla—for extortion in his province of Macedonia. To improve his eloquence, he went to Rhodes to study under the rhetor Apollonius Molo. In 74 B.C., he returned to Rome, where he had been elected pontifex, and now for the first time threw himself earnestly into public life. In the year 70 B.C., he attached himself to Pompey, whose political actions at this time were of a decidedly democratic character. In 68 B.C., C. obtained a questorship in Spain. On his return to Rome (67 B.C.), he married Pompeia, a relative of Pompey, with whom he was daily becoming more intimate. In 66 B.C., he was elected to the curule ædileship, and lavished vast sums of money on games and public buildings, by which he increased his already great popularity. For the next few years, C. is found steadily skirmishing on the popular side. In 63 B.C., he was elected pontifex maximus, and shortly after, pretor. During the same year occurred the famous debate on the Catiline conspiracy, in which the aristocratic party vainly endeavored to persuade the consul, Cicero, to include C. in the list of conspirators. In 62 B. C., Pompey returned from the east, and disbanded his army. Next year, C. obtained the province of *Hispania Ulterior*. His career in Spain was brilliant and decisive. On his return, he was elected consul, along with M. Calpurnius Bibulus. Shortly before the passing of the agrarian law (59 B.C.), C., with rare tact and sagacity, had reconciled the two most powerful men in Rome, who were then at variance, Pompey and Crassus, and had formed an alliance with them, known in history as the *First Triumvirate*. Both of these distinguished men aided C. in carrying his agrarian law; and to strengthen still further the union which had been formed, C. gave Pompey his daughter, Julia, in marriage, though she had been promised to M. Brutus; while he himself also married Calpurnia, daughter of L. Piso, his successor in the consulship. On the expiry of his term of office, he obtained for himself, by the popular vote, the province of *Gallia Cisalpina* and *Illyricum* for five years, to which the senate added—to prevent the popular assembly from doing so—the province of *Gallia Transalpina*. Nothing could have been more favorable for C.'s aims. He had now an opportunity of developing his extraordinary military genius, and of gathering round him an army of veterans, whom perpetual victory should inspire with thorough soldierly fidelity and devotion to his person. This was the very thing he wanted to give him a reputation equal to that of his coadjutors, Pompey and Crassus, whom, in genius, he far surpassed. Leaving, therefore, the political factions at Rome to exhaust themselves in petty strifes, C., in 58 B.C., after the banishment of Cicero, repaired to his provinces, and during the next nine years conducted those splendid campaigns in Gaul, by which, had he done

nothing else, he would have "built himself an everlasting name." C.'s first campaign was against the Helvetii, whom he totally defeated near Bibracte (Autun). Out of 368,000 only 110,000 remained. These were commanded by C. to return home and cultivate their lands. The eyes of the Gauls were now turned upon the new conqueror. His help was solicited, among others, by Divitiacus, an Æduan chief. This involved C. in a second war with a German prince, named Ariovistus, who was utterly overthrown; and now C., having in the course of one campaign successfully concluded two important wars, led his troops into winter quarters.

Next year (57 B.C.) occurred the Belgic war, in which C. successively routed the Suessiones, Bellovaci, Ambiani, and Nervii, who, alarmed at the progress of the Roman arms, had entered into an alliance with each other against the invaders. When the senate received C.'s official dispatches, it decreed a thanksgiving of 15 days—an honor never previously granted to any other general. During the winter and the spring following, C. stayed at Lucca; and, after spending large sums of money in hospitality, and in other less praiseworthy purposes, he departed for Gaul, where the flames of war had burst out in the north-west. The Veneti, a maritime people of Brittany, were the chief instigators of the insurrection. C.'s plans were laid with consummate skill, and were crowned with the most splendid success. The Veneti were totally defeated, and most of the other Gallic tribes were either checked or subdued. C. wintered in the country of the Aulerci and Lexovii (Normandy), having, in the course of three campaigns, conquered Gaul. Next year (55 B.C.), Crassus went to Syria, and Pompey to Spain, while C.'s provincial government was prolonged for five years. He now undertook a fourth campaign against two German tribes who were about to enter Gaul. He was again successful; and pursuing the fleeing enemy across the Rhine, spent 18 days in plundering the district inhabited by the Sigambri. He next invaded Britain, about the autumn; but after a brief stay in the island, returned to Gaul. The Roman senate, astonished at his hardihood and his successes in regions where no Roman army had ever been before, accorded him a public thanksgiving of 20 days. In 54 B.C., C. opened his fifth campaign by a second invasion of Britain. On his return to Gaul, C. was compelled —on account of the scarcity of corn, arising from drought—to winter his army in divisions. This naturally aroused the hopes of the Gauls, who thought the time had come for recovering their independence. An insurrection broke out in the n.e. of Gaul, which was at first partially successful, but was ultimately crushed. C. resolved to winter at Samarobriva (Amiens), in the vicinity of the malcontents. In 53 B.C., C. commenced his sixth campaign. It was chiefly occupied in crushing a second insurrection of the Gauls. C. now returned to northern Italy, that he might be able to communicate more easily and securely with his friends at Rome. That city was gradually becoming more anarchic, the evils of weak government more apparent; the hour for decisive action seemed to be approaching, and doubtless C.'s heart beat with expectation of the mighty future, when all at once the plot that fate was weaving in his favor appeared to be completely marred by a tremendous rebellion over the whole of Gaul, headed by a young warrior named Vercingetorix. It was in the dead of winter when the news came to C., who instantly saw that, at all hazards, he must preserve his fame and his army. Leaving, therefore, Pompey to succeed at Rome, he hurried to meet the insurgent hordes. His great difficulty was to collect his scattered legions. First crossing, with some cisalpine and provincial troops, the mountains of Auvergne, though they lay 6 ft. deep in snow, he suddenly appeared among the Arverni, who, terrified at his unexpected approach, sent for their chief, Vercingetorix, to come to their assistance. This was what C. wished. After some wonderful exhibitions of military skill and numerous successes, Vercingetorix was shut up in Alesia (Alise in Burgundy) with all his infantry. C. besieged him, and though harassed by nearly 300,000 Gauls without, who attempted, but in vain, to break through the well-defended Roman lines, forced Vercingetorix to capitulate. Many of the tribes now hastened to submit to C., who prudently determined to winter among the vanquished. The senate, of course, voted him another public thanksgiving. Next year (51 B.C.), C. proceeded to quell the tribes who still held out. This he successfully accomplished, and having in addition reduced the whole of Aquitania, passed the winter of his eighth campaign at Nemetocenna, in Belgium, where he spent the time both in a magnanimous and politic manner. The Gallic princes were courteously and generously treated; the common people were spared the imposition of further taxes, and everything was done to render it possible for him to visit Italy with safety in the spring. This he did, and took up his residence at Ravenna, where he was informed of everything that was going on by the tribune C. Curio. There can be no doubt that at this moment he was the most popular man in the state, while his soldiery were devoted to him with a loyalty as enthusiastic as that which Bonaparte inspired when fresh from his Italian victories.

Meanwhile, Pompey, whose vanity could not endure the greatness of C., had been gradually veering round again to the aristocracy, whose dread of the new conqueror was hourly increasing. After much futile diplomatic finessing on all sides, the senate carried a motion "that C. should disband his army by a certain day; and that, if he did not do so, he should be regarded as an enemy of the state." The tribunes, Mark Antony and Q. Cassius, put their veto on this motion; but they were violently driven out of the senate-chamber, and, fearing for their lives. they fled to C.'s camp. The

senate, in the madness of their terror, now declared war, and intrusted the conduct of it to Pompey, whose pride in the invincibility of his military prowess hindered him from taking the necessary measures for the defense of the state. He fancied that his name would bring thousands to his standard, and he was even led to believe that C.'s troops were willing to desert their general: the result of which delusion was, that when hostilities formally commenced, he had hardly any soldiers except two legions which had recently been in the service of his rival. C., on the other hand, perceiving that the time for decisive action had at length come, harangued his victorious troops, who were willing to follow him anywhere; crossed the Rubicon (a small stream which separated his province from Italy proper), and moved swiftly, amid the acclamations of the people, towards Rome. Pompey fled to Brundusium, pursued by C., but contrived to reach Greece in safety, 17th March, 49 B.C. The Italian cities had everywhere gladly opened their gates to the conqueror as a deliverer. In three months, C. was master of all Italy.

C. next subdued Pompey's legates in Spain, who were at the head of considerable forces. On his return, he took Massilia, where he learned that he had been appointed dictator of the republic—a function which at this time he retained only for 11 days, but these were honorably distinguished by the passing of several humane enactments. Pompey, now thoroughly alive to the magnitude of his danger, had gathered, in Egypt, Greece, and the east, a powerful army, while his fleet swept the sea. C., however, crossing the Adriatic at an unexpected season, made a rush for Dyrrhachium, where Pompey's stores were; but was nevertheless outstripped by his opponent. Pompey intrenched his army on some high ground near the city, where he was besieged by Cæsar. The first encounter was favorable to Pompey, who drove back C.'s legions with much loss. The latter now retreated to Thessaly, followed by his exulting enemies. A second battle ensued on the plains of Pharsalia, 9th Aug., 48 B.C. Pompey's army was utterly routed; Pompey himself fled to Egypt, where he was murdered. See POMPEY.

No sooner had the news reached Rome, than C. was again appointed dictator for a year, and consul for five years. He was invested with tribunicial power for life, and with the right of holding all the magistricial comitia except those for the election of the plebeian tribunes. He did not, however, return to Rome after the battle of Pharsalia, but went to Egypt, then in a distracted condition on account of the disputes regarding the succession. Out of love for Cleopatra (who subsequently bore him a son), he entered upon the "Alexandrine war," in which he was successful, and which he brought to a close in Mar., 47 B.C. He next overthrew a son of Mithridates, near Cela, in Pontus, Aug. 2 of the same year, and arrived in Rome in September. He was once more appointed dictator, and the property of Pompey was confiscated and sold. Before the close of the year, he had set out for Africa, where his campaign against the Pompeian generals, Scipio and Cato, was crowned with victory at the battle of Thapsus, 6th April, 46 B.C. Cato committed suicide at Utica, and with such irresistible celerity was the work of subjugation carried on, that by the end of the summer C. was again in Rome. Now occurred that display of noble and wise generosity which proves C. to have been possessed of a great magnanimous nature. He was not a man that could stoop to the vulgar atrocities of Marius or Sulla, and so he majestically declared that henceforth he had no enemies, and that he would make no difference between Pompeians and Cæsarians. His victories in Gaul, Egypt, Pontus, and Africa were celebrated by four great triumphs, during which the whole Roman populace was feasted and fêted by the magnificent liberality of the dictator.

He now proceeded to check, by wholesale enactments, as far as in him lay, the social evils which had long flourished in the city. During the year 46 B.C., also, he conferred a benefit on Rome and on the world by the reformation of the calendar, which had been greatly abused by the pontifical college for political purposes. After quelling an insurrection which now broke out in Spain, where Pompey's sons, Cneius and Sextus, had collected an army, he received the title of "Father of his Country," and also of *imperator*, was made dictator and *præfectus morum* for life, consul for 10 years; his person was declared sacred, and even divine; he obtained a body-guard of knights and senators; his statue was placed in the temples; his portrait was struck on coins; the month Quintilis was called Julius in his honor; and on all public occasions he was permitted to wear the triumphal robe. He now proposed to make a digest of the whole Roman law for public use, to found libraries for the same purpose, to drain the Pontine marshes, to enlarge the harbor of Ostia, to dig a canal through the isthmus of Corinth, and to quell the inroads of the barbarians on the eastern frontiers; but in the midst of these vast designs he was cut off by assassination on the ides (15th) of Mar., 44 B.C. The details of this crime—the greatest disaster that could have befallen the Roman world, as subsequent events showed—are too familiar to require narration. It is sufficient to say that, of the sixty aristocrats who were in the conspiracy, many had partaken of C.'s generosity, and all of his clemency. A few, like Brutus, out of a weak and formal conscientiousness, based on theory rather than insight, were probably offended by C.'s desire to change the form of government into a hereditary monarchy; but the most, like Cassius, were inspired by a spleenful hatred of the dictator, and the base ambition of regaining power at all hazards.

C., who was 56 years of age when he was murdered, was of a noble and kingly pres-

ence, tall of stature, and possessing a countenance which, though pale and thin with thought, was always animated by the light of his black eyes. He was baldheaded (at least in the latter part of his life), wore no beard, and though of a rather delicate constitution naturally, he ultimately attained to the most vigorous health. His besetting sin was sensuality; but without meaning to detract from the criminality of his conduct in this respect, it may be said that it was as much the sin of the times in which he lived as his own, and that the superlative grandeur of his position gave a prominence to his licentiousness which a more humble lot would have escaped. His intellect was marvelously versatile. In everything he excelled. He was not only the first general and statesman of his age, but he was—excepting Cicero—its greatest orator. As a historian, he has never been surpassed and rarely equaled in simplicity and vigor of style, and in the truthfulness with which he narrates events of which he was an eye-witness. He was, in addition, a mathematician, philologist, jurist, and architect, and always took great pleasure in literary society. Most of his writings have been lost, though their titles are preserved; but we still possess his invaluable *Commentarii* (generally known as "Cæsar's Commentaries on the Gallic and Civil Wars"). The *editio princeps* was printed at Rome 1449. C.'s life was formally written in ancient times by Suetonius and Plutarch. There are modern lives by Delorme, Napoleon III. (1865), and J. A. Froude (1879).

CÆSAR, Sir JULIUS, 1557–1636; an English statesman, educated at Oxford and the university of Paris; doctor of civil and canon law. He was master of the rolls, and held other high offices under Elizabeth and James I. He was noted for a gracious dignity of character, and for wide beneficence to the poor.

CÆSARE'A (*Turris Stratonis*), called by the natives "Kaisari'yeh." This once proud and splendid seaport, perhaps one of Herod's most magnificent works—a Grecian town with its temples, amphitheater, baths, etc., imported into Syria—was situated on the coast of Syria, 95 m. s. of Beyrout, and 37 m. n. of Jaffa.

In 65 A.D., Gessius Florus, the worst of all petty tyrants that had afflicted Judea, was appointed governor of Cæsarea. About that time, a terrible revolution, which commenced at C., broke out all over Judea. It arose from a dispute between the Syrian and Jewish citizens of C. as to which of them the city really belonged to; and some idea may be formed of the extent of the insurrection from the fact that above 20,000 Jews were massacred in C. in the space of one hour; 13,000 in one night at Scythopolis; 50,000 at Alexandria; 8000 at Joppa; and 10,000 at Damascus.

C. was occupied by the crusaders; after them, it seems to have gradually decayed into nothingness. It is now a heap of half-buried ruins, with a few miserable stone houses inhabited by fishermen.

CÆSARE'A PHILIP'PI (*Panium*). This town, mentioned in Matt. xvi. 13, was situated about 20 m. n. of the sea of Galilee. It was distinguished from the Cæsarea on the coast of Syria by the appendage of "Philippi," given to it in honor of Philip the tetrarch, who repaired the city. It is now a heap of ruins, overgrown with bushes and grass.

CÆSAREAN OPERATION (*cædo—cæsus*) has, from very ancient times, been the popular name for *hysterotomy* (*hystera*, uterus; *tome*, section). Pliny distinctly alludes to it in his *Natural History* (lib. vii. cap. ix.), saying that Cæsar was so called from being taken by excision out of the womb of his mother, and that such persons were called *Cæsones* (Cæsar a cæso matris utero dictus; quâ de causâ *Cæsones* appellati). In his case, the mother must have survived the operation, as Aurelia was alive when her son invaded Britain.

The pages of a popular work scarcely allow of the details of such a proceeding, but we may state that the first incision is made exactly in the middle line of the body, to the length of 6 or 7 inches. When the uterus is exposed, it must be carefully opened, the child lifted out, and then the after-birth. The uterus now contracts, and sinks down into the pelvis, the wound is closed, and opium is given to the patient to allay pain and nervous irritability.

In Great Britain, the C. O. has been rarely performed, most likely from the skill of the accoucheurs rendering such a proceeding unnecessary; but still several cases are on record where not only the child, but the mother, was saved. Some women, indeed, seem to have accepted it as their usual method of delivery, having several children, each requiring to be removed through an abdominal incision; one woman submitted to it seven times. It has also been successfully performed in most unfavorable circumstances. In the year 1500, a sow-gelder operated successfully on his own wife; an illiterate Irish midwife, Mary Donally, operated with a razor on a poor farmer's wife in Jan., 1738, and removed a dead child; her patient completely recovered, so as to be able to walk a mile on foot on the 27th day after the operation. Nay, a negro woman in Jamaica cut herself open with a butcher's knife, removed her infant, and recovered. Practitioners are not quite decided as to the circumstances which justify the performance of this severe operation on the living female, but all agree on the propriety of at once removing by it the child of a recently dead woman. Numa Pompilius decreed that every pregnant woman who died should be opened; and the senate of Venice, in 1608, decreed that practitioners should perform, under heavy penalties, the C. O. on pregnant women supposed to be dead. In 1749, the king of Sicily decreed the punishment of death to

medical men who omitted to perform it on women dying when advanced in pregnancy. Of course, to be of any use, it must be performed immediately.

CÆSIUM. See RUBIDIUM.

CÆSU'RA, a pause or division in a verse; a separation by the ending of a word, or by a pause in reading, of syllables rythmically connected, as in this line: "These parting num-bers, ca-denced by my grief."

CAF, or KAF, the mountain, or range of mountains, that in Arabic and Persian fiction surrounds the earth. The pivot on which the mountain rests is a great emerald from which the sky receives its colors, and the mountain is the dwelling-place of giants and genii. "From Kaf to Kaf" signifies from one to the other end of the world.

CAFFA. See KAFFA.

CAFFAREL'LI, or GAFFARELLI, GAËTANO MAJORANO, 1703–83; an Italian vocalist who, when a boy, was properly qualified for singing feminine parts, and was deemed the first soprano of the age. He was highly successful for many years, having no rival excepting possibly Farinelli; and he had success as a composer also. On returning to private life he built a palace, over the entrance of which he inscribed: "Amphion built Thebes; I this house," alluding to the story that the walls of Thebes rose without hands to the music of Amphion's lyre.

CAF'FEÏNE, or THEÏNE ($C_{16}H_{10}O_4N_4,2HO$), is the alkaloid or active principle of coffee (q.v.) and tea (q.v.). When isolated, it forms beautiful white crystals, with a silky luster, which are soluble in water, alcohol, and ether. It is present in coffee to the extent of about 1 per cent, and in ordinary or Chinese tea, from 2½ to 6 per cent; and is also found in Paraguay and Guiana teas. It may be extracted from coffee or tea by making a decoction in hot water, and adding acetate of lead, which causes a precipitate of caffeotannate of lead. When the latter is acted on by sulphuretted hydrogen, the lead is separated, and the C. left in solution. On evaporation of the liquid, and recrystallization from alcohol, the C. separates in crystals.

CAF'FER BREAD, a name given to several species of *encephalartos*, trees of the natural order *cycadaceæ* (q.v.), which, like many others of that order, have much starch in their stems, and afford food to the natives of South Africa. They are also called bread-trees.

CAFFERS. See KAFIRS.

CAFFRA'RIA. See KAFFRARIA.

CAFFRISTAN'. See KAFIRISTAN.

CAGAYAN' SOOLOO', an island of the Asiatic archipelago, in lat. 6° 58′ n., and long. 118° 28′ east. It is about 20 m. in circumference, well wooded and elevated.—Cagayan is also the name of a province, river, and lake on the island of Luzon, one of the Philippines.

CAGLI, a walled t. in the province of Urbino, Italy, at the confluence of the Cantiano and Busso, where there is an old Roman bridge over the former river. It is a bishop's seat, and has several monasteries, in one of which is a famous fresco by Giovanni Sanzio, the father of Raphael. Leather manufacturing is the chief business. Pop. 10,213.

CAGL'IARI, a province of Sardinia, occupying the s. part of that island; 5224 sq.m.; pop. '72, 393,208. The district is rough and mountainous, but the cultivation of grain and cattle-breeding are successfully prosecuted. There are mines of silver, lead, and iron.

CAGL'IARI, the capital of the island of Sardinia, situated on the side of a hill, on the n.e. shore of a spacious bay, and on the s. coast of the island, in lat. 39° 13′ n., long. 9° 8′ east. It has a spacious and safe harbor, defended by several forts, and is the emporium of all the trade of the island. The town contains many public buildings and churches, and has a university with 100 students; but its streets, for the most part, are very narrow, steep, and dirty. C. has a pop. of (1881) 35,588. It has also a dockyard, and a good road was some years ago constructed from C. to Sassari, the second city in the island, and to some of the more considerable places. Steamers ply very frequently between C. and Genoa; and it is now united to the continent of Europe by a line of electric telegraph.

CAGL'IARI, PAOLO, best known as *Paolo Veronese*, an Italian painter of great eminence, was b. at Verona in 1532. He first studied under his uncle, Antonio Badile, a respectable artist, and afterwards settled in Venice, where he rapidly acquired both wealth and reputation. He had for contemporaries both Titian and Tintoretto, and was held in equal admiration with these famous painters. The church of San Sebastiano, in Venice, contains many of his productions, which are reckoned the most important of his earlier period—i.e., the period before he visited Rome, when he first became acquainted with the masterpieces of Raphael and Michael Angelo. The influence of the Roman school on his style was so happy, that, on his return, he received the honor of knighthood from the doge. He died 19th April, 1588. C. is remarkable for the fertility of his

imagination. His design is generally noble, his composition rich, and his execution truthful. In the invention of details, especially, he is inexhaustible, and often overloads his pictures with ornament. One peculiarity of his works is the frequent introduction of splendid architectural backgrounds, which, however, were generally painted by his brother Benedetto. The most celebrated of his productions is the "Marriage Feast at Cana of Galilee," now in the Louvre at Paris. It is 20 ft. high, and 30 in length, and contains 130 figures. Besides these may be mentioned "The Calling of St. Andrew to the Apostleship," "The Feast of Simon," and the "Presentation of the Family of Darius to Alexander."

CAGLIOSTRO, Count ALESSANDRO DI, a notorious impostor, who, in the latter part of the 18th c., traveled through Europe, and whose adventures afford considerable insight into the social characteristics of his times. He was born at Palermo, of poor parentage, June 2, 1743, and his true name was GIUSEPPE BALSAMO. Carlyle's picture of him when a boy—"brass-faced, vociferous, voracious"—is probably accurate, and already prophesies the bold and boisterous quack. When 13 years old, he ran away from the seminary of St. Roch, and was afterwards sent to a monastery at Cartagiore. Here he became assistant to the apothecary of the monastery, and picked up that scanty knowledge of chemistry and medicine, which was afterwards found quite sufficient to impose upon so many respectable individuals. His conduct in the monastery was in keeping with his character, but finding it too contracted a sphere for the development of his ambitious genius, he left it, or was ejected, and for a time led "the loosest life" in Palermo. When 26 years old, he found it highly advisable to leave his native place. In company with a certain sage named Althotas, C. is vaguely represented as traveling first in some parts of Greece, Egypt, and Asia. At Rome, "his swart, squat figure first becomes authentically visible in the Corso and Campo Vaccino. He lodges at the sign of the Sun in the rotunda, and sells etchings there," very hard up at this time. In Venice, "the bull-necked forger" contrived to marry a very pretty woman named Lorenza Feliciana, who became a skillful accomplice in his schemes, and captivated many admirers, while C. picked their pockets. C. now made the tour of Italy with great success as a physician, philosopher, alchemist, freemason, and necromancer! Next, he extended his victorious career through some parts of Germany, and especially carried on a lively business in his "elixir of immortal youth," which became very popular among the ladies. By virtue of this fine medicine, the count assured his patients that he had already attained his 150th year, while his young and charming wife often talked affectionately of her son as "a commander in the Dutch navy." Through Courland, the count and his accomplice advanced triumphantly to the court of St. Petersburg, where he seems to have first made a failure; for the empress Catharine, aided by her Scotch physician, Rogerson, a keen-witted native of Annandale, who skeptically examined his famous "Spagiric food," and pronounced it "unfit for a dog," penetrated his real character, and made him the subject of a comedy. C. soon found it convenient to vanish. We next find him at Warsaw, discoursing on his pet Egyptian masonry, medical philosophy, and the ignorance of doctors, but he has the misfortune to be unmasked by a certain count M. This, however, had little effect on the stupid credulity of C.'s dupes—belonging, it must be remembered, to the upper classes, who in that age, according to Carlyle, were at once sensual, infidel, and superstitious—so that they persisted for a time in "distending his pockets with ducats and diamonds," which, however, his lavish dissipation soon scattered to the winds—for this prophet of a new physical and moral regeneration, and inventor of an "invaluable pentagon for abolishing original sin," was a desperate gambler. In 1780, he went to Strasburg; and soon afterwards we find him in Paris, still founding lodges of "Egyptian freemasons," holding nocturnal meetings for calling "spirits from the vasty deep," etc., and scandalously simulating the character and deeds of a philanthropist. From Paris he came over to England, where he was cordially received by the followers of Swedenborg. On his return to Paris (1785), he became distinguished at court, was intimate with the weak and credulous cardinal Rohan, and played a prominent part in the affair of the diamond necklace (q.v.). This lodged him in the Bastille; but he cleared himself by a statement which gained credit, and, after being liberated, carried on his adventures once more in England, but feebly, the sunshine of success now obviously growing dim; in short, the count, in gloom and foreboding, disappeared from the island. But the market in Germany, too, was closed, a general distrust having been excited by the revelations of one of the count's dupes. Elsewhere, also, these began to fail him. "At Aix, in Savoy, there are baths, but no gudgeons in them;" at Turin, he is ordered off by the king; a similar fate befalls him at Roveredo; at Trent, we catch a glimpse of him, "painting a new hieroglyphic screen," which, however, attracts no more the gaping crowd; lower still, "he pawns diamond buckles;" finally, his wayworn wife—in whom, perhaps, because of her womanhood, the enormous lie and quackery first breaks up—"longs to be in Rome by her mother's hearth, by her mother's grave, where so much as the shadow of refuge awaits her." In May, 1789, he entered the city; on the 29th December, the holy inquisition detected him founding "some feeble ghost of an Egyptian lodge." He was imprisoned, and condemned to death for freemasonry. His sentence was commuted to imprisonment for life in the fortress San Leon, where, in spite of his "elixir of immortal youth," he

died, 1795, aged 52 years. His wife ended her days in a convent. His *Mémoires Authentiques*, posthumously circulated in Paris, were *not* authentic.—See Carlyle's *Miscellaneous Essays*, art. Count Cagliostro.

CAGNOLA, Luigi Marchese, a distinguished Italian architect, was b. at Milan in 1759—d. 1833. Belonging to an ancient and wealthy family, he could afford to follow the bent of his own inclination, and devoted himself earnestly to the study of architecture. His master-works are two triumphal arches. The first is the famous *Arco della Pace*, in Milan, commenced in 1807, but not finished until 1838. It is constructed of white marble, and, with the exception of the *Arc de l'Etoile*, in Paris, is both the largest and noblest structure of the kind in Europe, reaching a height of 78 feet. On the top of the arch is a bronze figure of Peace, in a car drawn by six horses, while the sides are richly adorned with innumerable bas-reliefs. The second forming the *Porta di Marenga*, or *Porta Ticinense*, is also a work of great beauty, and is much admired. Besides these may be mentioned the *campanile* (bell-tower) at Urgnano, in the Bergamese.

CAGOTS is the name given to a tribe of men, of manners and customs akin to those of the gypsies, who are found scattered through various parts of Bearn and Gascony, in France. They are usually thought to be the descendants of the Visigoths, who remained in France after their defeat by Clovis, in the 5th century. Until the French revolution of 1790, they received even worse treatment than that which generally falls to the lot of remnants of conquered races. They were forced to wear a peculiar dress, were forbidden to practice all but the most menial trades, and were obliged to live isolated, either in separate villages or in separate quarters of the towns. So complete was their estrangement from the other inhabitants, that they were forced to enter the churches by doors specially set apart for them. Since that revolution, they have been placed, as regards the law, on an equal footing with other citizens, but socially they are still regarded as a degraded race. Their language has been, so far back as is known, a corrupt dialect of that spoken in the surrounding country; but their blue eyes, fair hair, and fair complexion, mark them out as ethnologically distinct, and speak to a Teutonic origin. From a great liability to the diseases afflicting cretins, probably caused by their exposed manner of life and insufficient nourishment, they were at one time erroneously thought to belong to that unfortunate class. Tribes, whose history and present condition greatly resemble those of the C., are to be found in Brittany, where they receive the name of "Caqueux;" and in Poitou, Maine, and Anjou, where they receive the name of "Colliberts." See Michel's *Histoire des Races Maudites de la France et de l'Espagne* (History of Outcast Races in France and Spain), Par. 1847.

CAGSA'NA, a t. near the southern extremity of the island of Luzon, Philippines, with a population of about 13,000.

CAHAW'BA, a river rising in Jefferson co., Ala., flowing s.w. through a region rich in coal, and joining the Alabama 8 m. w. of Selma. The C. is navigable by small craft for about 100 miles.

CAHEN, Samuel, 1796–1862; a French Jew noted as a Hebrew scholar. He translated the Old Testament into French with Hebrew on opposite pages, and with notes and comments. He also founded the *Archives Israelites*, a monthly publication devoted to Jewish questions and interests.

CAHE'TÉ, or Caete, a small t. of Brazil, in the province of Minas Geraes, about 250 m. n. of Rio de Janeiro. The town is tolerably built, has some churches, a hospital, primary school, electoral college. Agriculture and mining are carried on. Pop. about 6000.

CAHINCA, the Indian name of the plant known in Brazil as the *raiz petra*, used by the natives as a purgative, emetic, or diuretic medicine.

CA'HIR, a t. in the co. of Tipperary, Ireland, on the Suir, beautifully situated at the e. end of a valley between the Galtees and Knockmeledown mountains, 8 m. n.w. of Clonmel. In the town is the seat of the earl of Glengall, with a park which extends along the river for 2 m. below the town. Cahir castle, an ancient irregular Norman structure of considerable extent, is situated on a rock on the left bank of the Suir. It was taken by the earl of Essex in 1599, and by Cromwell in 1650; it has been lately restored. C. has extensive flour-mills, and a pop. of (1881) 2469. There are large barracks near Cahir.

CAHORS (anciently, *Divona*), a t. in the department of Lot, France, is situated on a small rocky peninsula, formed by a bend of the river Lot—here crossed by three bridges—about 60 m. n. of Toulouse. The streets of C. are steep and narrow, and present many specimens of antique architecture. It has a fine cathedral, and several Roman remains, including those of a magnificent aqueduct. There is an obelisk to Fénélon, who was a student at the university here. The town was taken and pillaged by Henri of Navarre in 1580. It has manufactures of cotton-yarn, woolens, leather, paper, glass, etc.; the district produces wine in considerable quantities. The pop. in 1872 was 11,416: and in '76, 12,190.

CAI'APHAS, high-priest of the Jews in the reign of Tiberius Cæsar, at the beginning of Christ's ministry, and also at the time of his trial and crucifixion. His wife was the

daughter of Annas, a former high-priest, who still had great influence in sacerdotal matters. In the council summoned by the chief-priests and Pharisees to take action upon the remarkable spread of the doctrines of Jesus, Caiaphas, was decidedly in favor of putting him to death, using the prophetic language: "Ye know nothing at all; nor consider that it is expedient for us that one man should die for the people, and that the whole nation perish not." Christ was arraigned before Caiaphas, when the effort to convict him on false testimony failed; and then the prisoner was called as a witness and asked if he was indeed the Christ, the son of God. The answer being in the affirmative, the high-priest pretended to be sorely grieved at what he considered blasphemy, and appealed to Christ's enemies to say if that was not enough. The answer was that Christ deserved death, and without remonstrance from the high-priest, they at once fell upon the prisoner with insult and injury. But the high-priest had not the power of final condemnation, that being in the hands of the Roman governor only.

CAI'COS, or CAY'OS, or KEYS, a term applied to numberless rocky islets of the West Indies, and that generally with a reference to some more considerable island in the neighborhood. Thus, to take the Bahamas as an instance, there are the Keys of Providence, of Eleuthera, of Abaco, etc. But more specifically the name is often appropriated to the more southerly members of the group just mentioned—North, West, East, Grand, and other keys together covering about 450 sq.m., and containing about 5000 inhabitants. They lie between 21° and 22° n. lat., having been transferred, with a local president, from the government of Bahama to that of Jamaica. The revenue is about £8000. The imports are valued at nearly £30,000; and the exports (consisting chiefly of salt) at £25,000.

CAI'FA, or HAI'FA, a seaport on the coast of Syria, situated exactly opposite Acre, upon a spur of Mt. Carmel, and on the s. side of a wide semicircular bay, 4 m. across. It is the ancient Hefa, or Sycaminopolis. It covers but a small space of ground, and contains no edifice of any note except a few minarets. The houses are built of rough unhewn sandstone, plastered over with lime—the roofs flat. Pop. about 2000—Moslems, Christians, and Jews. C., having a better anchorage than Acre, is fast eclipsing that city as a port, and in recent years almost all the trade of Acre has been transferred to it. Consular agents from England, France, etc., have, within twenty years, been established at C.; and among other improvements are a coffee-house and billiard-room, things rare in Syria. Several cargoes of barley, wheat, and sesame seed are yearly shipped at C., and exported to Great Britain and France. C. is surrounded by beautiful gardens of palm, olive, orange, citron, fig, mulberry, and pomegranate trees.

CAILLIAUD, FRÉDÉRIC, 1787–1869; a French goldsmith who traveled in various parts of Europe, Egypt, and Asia Minor. He was engaged by Mehemet Ali to explore the deserts along the Nile and near the Red Sea, and in the work discovered the emerald mines of Mt. Zabarah. He returned to France with a valuable collection of antiquities, plants, and minerals, and published *Voyage a l'Oasis de Thebes*, etc. He went again to Egypt and made explorations in the eastern deserts, making an expedition to upper Nubia with Ismael Bey. In 1819–22, he published *Voyage a Meroe.* Among the relics of antiquity brought by him to France and purchased by the government, was a mummy, inscribed with hieroglyphical characters accompanied with a Greek translation, which proved of great help to Champollion in the study of the ancient language.

CAILLIÉ, RENÉ or AUGUSTE, a French traveler, noted for his journey to Timbuctoo, was born 19th Sept., 1799, at Mauzé, in the department of Deux-Sèvres. Having gone to Senegal, and engaged in trading with the natives, he learned, about 1826, that the geographical society of Paris had offered a premium of 10,000 francs to the first traveler who should reach Timbuctoo. Provided with a stock of goods for barter, C. started from Sierra Leone, Mar. 22, 1827, and after some delay caused by illness, he reached the mysterious city in April, 1828, where he remained 14 days. On leaving Timbuctoo, he accompanied a caravan across the Sahara desert, reaching the coast at Tangier. After hearing and examining his statements, the society awarded him the offered prize, with a pension of 1000 francs, and the order of the legion of honor. His notes of travel, arranged by M. Jomard, were published under the title *Journal d'un Voyage à Temboukton et à Jenné dans l'Afrique Centrale*, etc. (3 vols., Par. 1830). In England, doubts were raised as to the veracity of C., but without just grounds. C. died at his estate, in the neighborhood of Paris, May 25, 1838.

CAIMACAN', or KAIMAKAM, a Turkish officer corresponding with lieutenant or lieutenant-governor. The caimacan of Constantinople is the lieutenant of the grand vizier, whom he represents in processions. Such officers also act as governors in the principal towns.

CAIN, the first-born of Adam and Eve. His history, as recorded in the book of Genesis, is mysterious and inexplicable, and the traditions which a later superstition has gathered round it, have thrown no light whatever on its dark perplexity. As the first murderer, his memory has always been profoundly execrated by the Christian church; yet such is the perversity of human nature, that one sect—if not more—of the pseudo-Gnostics found his actions and character so much to their liking, that they called themselves *Cainites* (130 A.D.), and invented an explanation of his alleged crime, which, like

most of the Gnostic heresies in the early church, sprang out of the deep-rooted fundamental error of the "two principles." The Cainites believed that C. was the offspring of the intercourse of a superior power with Eve, and Abel of an inferior power; that their characters corresponded to their paternal parentage, and that the slaying of Abel only symbolized the victory of the superior over the inferior power. The subsequent punishments of C. were regarded as the persecutions of Abel's father—i.e., the Jewish God. For the same reason, they highly honored all the reprobates of the Old Testament—such as the people of Sodom, Esau, Korah, Dathan, and Abiram—whom they looked upon as the victims of the hatred of Jehovah. It is unfortunate that we possess only distorted and fragmentary accounts of this, as of all the other heretical sects. The Cainites are also said to have denied the dogma of the resurrection of the body, to have rejected the New Testament, and accepted a gospel of Judas, the betrayer, whom they also reverenced for the singular reason that his crime, by procuring the death of Christ, secured the salvation of men.

CAINOZO'IC (Gr. "recent life"), a geological term, synonymous with tertiary, introduced with other words by Mr. Phillips, to avoid the confusion which attended the use of the terms primary, secondary, and tertiary, owing to the various meanings attached to them by geologists.

ÇA IRA (French for "It will go on!"), the well-known refrain of the song beginning with—

"Ah, ça ira, ça ira, ça ira!
Les aristocrates à la lanterne!"

which must always be remembered as associated with the most terrible scenes of the French revolution. Like the *Marseillaise*, the *Carmagnole*, and the *Chant du Départ*, it became a French national song, and was styled the *Carillon National*. The melody, taken from another song, is said to have been a favorite air with the unhappy Marie Antoinette.

CAIRD, James, b. 1816; an agriculturist of Scotland, author of *High Farming as the Best Substitute for Protection*. In 1850–51, he visited all parts of England as agricultural writer for the London *Times*, his letters being afterwards published in a volume. In 1858, he visited the United States and wrote an account of the western territories. While in parliament he was the originator of agricultural statistics, now annually published by the British government. He is a magistrate in co. Wigton, and was made K.C.B., '82.

CAIRD, Rev. John, D.D., a minister of the established church of Scotland, and one of the most eloquent living preachers in Great Britain, was b. at Greenock in 1820. He studied at the university of Glasgow, and in 1845 was ordained to the pastorate of the church of Newton-upon-Ayr, whence in 1847 he was translated to Lady Yester's, Edinburgh. Here his popularity was extraordinary, but the demands made on his physical energies were so great, that he found it necessary to retire to the country, and accepted, in 1849, the country charge of Errol, in Perthshire. A sermon which he preached before the queen in 1855, in the church of Crathie, and which was published, by royal command, under the title of *The Religion of Common Life*, was universally admired throughout Great Britain; translated on the continent under the auspices of chevalier Bunsen, who wrote a preface to it, and suddenly carried the fame of the author into all parts of the Protestant world. In 1857, Dr. C. accepted a call to Glasgow. In 1858, he published a volume of sermons, marked by beauty of language, strength of thought, and earnest sympathy with mankind. He received the degree of D.D. in 1860. In 1862, he was appointed professor of divinity, and in 1873, principal of Glasgow university. In 1874, he published *The Universal Religion*, a lecture delivered in Westminster abbey.

CAIRN, or Carn, a Celtic word, signifying a protuberance, a heap, a pile. In that sense, it appears in the names of hills and other natural objects in Scotland, Ireland, Wales, Cornwall, and Brittany. It is also applied to artificial heaps of unhewn stones, which, among archæologists, have come to be generally known as "cairns."

There are several kinds of cairns. The simplest and most common form seems to be a conical pile of stones of no great size. Next is what may be called the fence or ringed C.—a heap of stones girdled round by large unhewn stones set upright in the ground. Some cairns have two, and a very few have three such concentric girdles; in some instances, there are concentric rows of upright stones within the cairn. Many cairns are found in the neighborhood of the circles of unhewn stone pillars which antiquaries used to style "Druidical." In a few instances, cairns are found at the end of an avenue of standing stones. Some cairns are fenced round by a narrow ditch and a small earthen rampart. A very few cairns have unhewn flat stones on their tops; a still smaller number are surmounted by an unhewn stone pillar. A few are oblong in shape.

Cairns were erected, doubtless, for several purposes. It appears from record that they were often raised to distinguish the marches or boundaries of lands. One C., near Balmoral, on the Highland Dee, is said to have been erected as a mustering-place for the men of Strathdee, who took its name, *Cairn-na-cuimhne*, or "C. of remembrance," for their slogan or war-cry. In later times, places where great crimes had been committed were marked by cairns; thus, "Mushet's C.," in the Queen's park at Edinburgh, shows the spot where a wife was murdered by her husband, under circumstances of peculiar atroc-

ity, in 1720. But that the great purpose of the C. was sepulchral, is shown by the human remains found in so many of them. "*Disjectis et erutis, ossa inveniuntur, et quibusdam honor nominis adhuc manet,*" says Robert Gordon of Straloch, writing of Scotch cairns in 1654. "For the cairns or heaps of stones in several parts of Ireland," wrote Thady O'Roddy in 1617, "some of them were heaped as monuments of battles, some made in memory of some eminent persons buried in such a place." A Highland suppliant would have said to his benefactor: *Curri mi cloch er do charne,* "I will add a stone to your cairn." The bones found in cairns are generally calcined or half-burned, and inclosed either in what are called *cists*—small rude coffins of unhewn stones—or in urns of earthenware, which, again, are in many cases protected by stone cists. Along with the bones are often found flint arrow-heads, flint axe-heads, stone hammers, stone rings, glass beads, implements of bone, bones of horses and oxen, spear-heads, and other weapons of bronze. In some instances, human bones are found unburned, inclosed in stone cists about 3 ft. long, or, more rarely, of the full size of a man. In one case, as many as seventeen stone cists were found in one cairn.

Many cairns are of considerable size. Each of three cairns at Memsie, near Fraserburgh, in Aberdeenshire, was about 300 ft. in circumference, and about 40 ft. high. A C. in the parish of Minnigaff, in Galloway. was 891 ft. in circumference. Several of the larger cairns are what is called "chambered"—that is, have internal galleries or cells. Of three large ringed cairns at Clava, on the banks of the Nairn river, near the battlefield of Culloden, one was found to contain a gallery, about 2 ft. wide, leading from the s. side of the C. to a circular chamber in the center, about 15 ft. in diameter, built of unhewn and uncemented stones, each course overlapping the other so as to meet at the top in that sort of rude dome which has received the name of the "beehive house" (q.v.). The Boss C., on the moor of Dranandow, in the parish of Minnigaff, had two galleries crossing each other—each 80 ft. long, 4 ft. wide, and 3 ft. high.

But of all the "chambered" cairns, the most remarkable is that at New Grange, on the banks of the Boyne, near Drogheda, in Ireland. It is 400 paces in circumference, and about 80 ft. high, and is supposed to contain 180,000 tons of stones. In 1699, it was described by Edward Llhwyd, the Welsh antiquary, as "a mount or barrow, of very considerable height, encompassed with vast stones, pitched on end, round the bottom of it, and having another, lesser, standing on the top." This last pillar has disappeared; of the outer ring of pillars, ten still remain, placed at about ten yards one from another. "The cairn," says Mr. Wakeman in his *Archæologia Hibernica* (Dublin, 1848), "in its present ruinous condition, presents the appearance of a grassy hill partially wooded; but, upon examination, the coating of earth is found to be altogether superficial, and in several places the stones, of which the hill is entirely composed, are laid bare. The opening [which is nearly square, and lined by large flags] was accidentally discovered about the year 1699. The gallery, of which it is the external entrance, communicates with a [dome-roofed] chamber or cave nearly in the center of the mound. This gallery, which measures in length about 50 ft., is, at its entrance, 4 ft. high; in breadth about 3 feet. Towards the interior, its size gradually increases; and its height, where it forms the chamber, is 18 feet. The chamber is cruciform, the head and arms of the cross being formed by three recesses—each containing a basin of granite. The sides of these recesses are composed of immense blocks of stone, several of which bear a great variety of carving, supposed by some to be symbolical. The majority of these carvings must have been executed before the stones had been placed in their present positions. The length of the passage and chamber from n. to s. is 75 ft., and the breadth of the chamber from e. to w. 20 feet. Of the urns or basins in the recesses, that to the e. is the most remarkable. It is formed of a block of granite, and appears to have been set upon, or rather within, another of somewhat larger dimensions." The Irish antiquaries believe that the chambered C. of New Grange—"the cave of Achadh Aldai," as it was called, from Aldai, the ancestor of the Tuatha De Danaan kings—was opened and rifled by the Norsemen in 862. About a mile from it, on either side, are other two cairns of nearly equal size, named Knowth and Dowth. The latter was opened in 1847, and found to contain a gallery, a cruciform chamber, a basin or sarcophagus, and carved stones, all of the same type as those of New Grange. Engravings of the sculptures, in both cairns, are given in Mr. W. R. Wilde's *Boyne and Blackwater*, pp. 192–207 (Dublin, 1850), and some of them are obviously of the same character with sculptures found in Scandinavia; at Locmariaker, and at Gavr Innis, in the Morbihan, in Brittany; in one of the cells of a tumulus opened in 1853 at Pickaquoy, near Kirkwall, in Orkney; among the ruins of an ancient fort at the Laws, near Dundee; at the ancient forts at Rowtin Lynn, and Old Bewick, in Northumberland; and on one of the standing stones near Penrith in Cumberland, called "Long Meg and her Daughters."

Cairns are most frequent in stony countries. Where, as in many parts of England, stones are scarce, the barrow or earthen mound came in place of the C., from which it differs only in the materials of which it is made. So also in Scandinavia. Cairns, or *dysser*, as they are there called, are rare in Denmark, but of more common occurrence in Sweden and Norway.

CAIRNES, John Elliott, 1824–75; b. Ireland; educated at Trinity college, studied law, and was admitted to the Irish bar, but passed most of his time in writing for the

press, chiefly upon economical questions affecting Ireland. In 1856, he was appointed professor of political economy in Dublin, and the next year his professional lectures were published under the title *Character and Logical Method of Political Economy.* He next wrote for *Fraser's Magazine* a series of essays on the gold question, induced by the sudden increase of supply from California and Australia. In 1861, he was appointed professor of political economy and jurisprudence in Queen's college, and in the next year published his work on *The Slave Power.* His conclusions were to a large extent verified by the results of the war in the United States then just commenced. In 1866, he was appointed professor of political economy in University college, London. His later years were spent in collecting and publishing his numerous papers, and in writing his chief work, *Some Leading Principles in Political Economy, newly Expounded.* He is regarded as high authority on subjects connected with political economy.

CAIRNGORM STONE, or simply CAIRNGORM, a name often given by jewelers, and particularly in Scotland, to brown or yellow quartz or rock-crystal, because found at Cairngorm, in Aberdeenshire. The same mineral is found in many other localities, as at Olivet near Orleans, in Brazil, and in Siberia. In Cairngorm and the neighboring district of Mar, it occurs both in the granite rock and in the alluvial soil. It differs from common colorless quartz or rock-crystal only in the presence of a very little oxide of iron or manganese, to which it owes its color. It is much used as an ornamental stone. The yellow variety is not unfrequently called topaz, although quite different from the true topaz, which it resembles chiefly in color, having neither its hardness nor its brilliancy. The topaz is, however, sometimes found along with it in the granite and gneiss districts of Mar and Cairngorm. The brown variety is sometimes called SMOKY QUARTZ, and when of a good and uniform color is by some preferred to the yellow.

CAIRO, a city in Alexandria co., Ill., on the extreme southern point of the state, at the junction of the Mississippi and Ohio rivers, 147 m. by rail s.e. of St. Louis; pop. '70, 6267; in '80, 9026. The Illinois Central railroad ends here, and connects by ferry with the Mobile and Ohio railroad at Columbus, in Kentucky. All the steamers of the Ohio and Mississippi make C. a stopping-place. It is a port of entry, and has a fine custom-house, and some other handsome buildings. The founders of C. anticipated its becoming the largest and most important city in the Mississippi valley, but the location was unhealthy, and the land so low that costly dikes were necessary to protect it from inundation; and even these did not suffice, for in 1858 the city was nearly destroyed by a flood. Since then, however, ample protection has been provided.

CAI'RO (Arabic, *Musr el Kahirah,* "the victorious capital"), the capital of modern Egypt, is situated in lat. 30° 2′ n., and long. 31° 16′ e., in a sandy plain betwixt the right bank of the Nile and the ridge of Mokattam, and near the point of the delta of the Nile. From the foundation of the city in 969, the Fatimite caliphs of Africa, who brought the bones of their ancestors with them from Kairon, reigned for ten generations over the land of Egypt. The caliph Hakem, who built a mosque near Bab-el-Nassr, and who is the supposed founder of the Druse religion, was the third in the succession. In the year 1171, Saladin usurped the throne from the last of the Fatimites. His descendant, Moosa-el-Ashref, was deposed in his turn in 1250; from that time till the year 1517, when the city was stormed and taken by sultan Selim, C. was governed by a succession of Mameluke kings.

The city of C. occupies about 3 sq.m., and is surrounded by a low wall. Of late years it has been greatly improved. It is lighted with gas, and many fine broad streets have been opened through the crowded districts. The bazaars are well and richly supplied. The houses, which are generally two or three stories high, are all built of variegated brick, with interlinings of wood, and have flat roofs. The city is divided into different quarters, one quarter being appropriated to the Turks, one to the Christians, one to the Jews, etc.; so that every religious sect has its own quarter, which is separated from the adjoining one by strong gates at the end of the streets; these are closed at night, and guarded by a porter, who opens the gate when any one wants to pass.

The most remarkable buildings in the city of C. are its minarets and mosques. The minarets are the most beautiful of any in the Levant, of a prodigious height, and built of alternate layers of red and white stone. The most ancient of all the minarets is that attached to the great mosque of sultan Tayloon. This mosque was built in the year of the Hegira 265 (879 A.D.), before the foundation of the city, and consists of an immense cloister or arcade built on pointed arches, being the earliest extant in that form. Another magnificent mosque is that of the sultan Hassan, situated in the place of the Roumayli, near the citadel, and which was finished about the year 1362 A.D. It has two very elegant and high minarets, and the mosque in consequence of its size, and the thickness of its walls, was frequently seized and made use of as a fortress by the insurgents in the numerous rebellions and insurrections which were always taking place at C. under the rule of the Mameluke kings. Stains of blood are still to be traced on the marble walls of the courtyard.

The population of C. consists of the ruling class, who are all Turks; Arabs, the former conquerors of the land, who form the bulk of the population, all the petty tradesmen and cultivators of the soil being of Arab origin; Copts, who are descended from the original lords of the land, the ancient Egyptians; Jews, Armenians, Syrians, Afri-

cans, and Europeans. Pop. '81, 368,108. The Copts, a mere fraction of the population, completed, in 1867, a fine, lofty, spacious church. Since 1863, the part of C. occupied by Europeans has been handsomely rebuilt. In 1876, C. was connected by rail with Heluan, one of the numerous bathing-places lying to the south.

Of objects worthy of note in the environs of C., there may be mentioned the tombs of the caliphs, situated about a mile beyond the walls, which are magnificent and imposing buildings, forming beautiful specimens of Arabian architecture. The mausoleum of sultan Bergook is a triumph of Saracenic architecture. The public gardens, which consist of groves of orange, citron, palms, and vines, are very beautiful. The trade of C. is rapidly increasing. The exports consist mainly of native products, such as ivory, gum, wood, hides, ostrich feathers, cotton, and sugar; while the imports are cotton and woolen goods, prints, hardware, cloth, furniture, shawls, indigo, sheep, tobacco, etc. The manufactures of C. embrace silk and cotton fabrics, gunpowder, glass lamps, sugar, sal ammoniac, weapons, and iron ware. C. is a great seat of learning, and popular education has recently advanced. The government college and the national schools are largely attended, while several thousand pupils attend the theological university attached to the mosque of Ezher. The schools comprise a commercial and juridical school at the Darb Algamâmîz, a school of arts and industry at Boolak (q.v.), and military schools at the Abbasseeyah. The language spoken at C. is Arabic, which, though not the purest, is superior in pronunciation to that spoken in Syria. C. is the official residence of the khedive of Egypt, and the residence of a consul-general from Great Britain, France, etc. C. has railway connection with Alexandria and Suez, and there is also a line to upper Egypt.

CAISSE, a coffer, box, case, or chest; in finance, a cash-box, or pay-office, or fund for payments. In anatomy, the drum of the ear. The French call a savings bank, "caisse d'epargne."

CAIS'SON, in military matters, is a name sometimes given to a tumbril or ammunition wagon. It is more frequently applied, however, to a large wooden chest or frame, loaded with powder, shells, or both, and buried several feet deep in the ground under some fortification; this destructive combination is to be blown up if there be danger of the enemy approaching and taking possession of that particular part of the defense-work. The French give the name of *caisson pour les vivres* to a large chest, carried with the army, and capable of containing 800 rations.

CAIS'SON, in relation to shipping, is an apparatus for lifting a vessel out of the water for repairs or inspection. It is usually a hollow structure, sunk by letting water into it. There is an air-chamber inside, which allows it to sink only to a certain depth. In that state it is hauled under the ship's bottom, the traps or openings are closed, the water is pumped out, and the caisson rises with the ship upon it.

In another arrangement, a platform is sunk to a certain depth in the water, and is suspended by iron screws from a strong wooden frame-work; the ship is floated upon the platform, steadied by shores, and lifted high and dry by means of levers, wheels, pinions, and screws.

CAISSON (*ante*), in engineering, a hollow box of iron or wood, open at the bottom, sunk where piers are to be placed. The largest caisson yet sunk was for the tower of the Brooklyn bridge on the New York side. At the bottom it was 172 ft. long and 102 ft. wide, with an air-chamber 9½ ft. high, the roof 22 ft. thick, and the sides carried up 82 ft. from the lower edge. It had a coffer-dam in the upper part; was built of timber lined with boiler-iron, and bolted together. In its construction there were used of lumber, board measure, 4,200,000 ft., and of iron, including bolts, 620 tons. When completed, it weighed 13,271 tons, and there were 30,000 tons of masonry laid within it. There were two double air-locks extending into the air-chamber, in which were steam-pipes to keep an even temperature. Two shafts passed up through well-holes in the masonry, with an elevator in one, and two spiral stairways in the other. Below the lowest edge of the caisson extended two water-shafts, each 7¾ ft. in diameter, in which dredges and scoops grappled the stones and soil, raising their loads to cars above, which conveyed the refuse away. At the same time sand and fine dirt were blown out by air-pressure through 40 or more pipes in various parts of the structure. The interior was illuminated by gas, and constant communication by telegraph was kept up with the workmen inside. There were four shafts, each 2 ft. in diameter, for the introduction of material for the concrete with which the whole interior was finally filled. The caisson was sunk 78 ft. below mean tide, a work that required a pressure of 34 lbs. per sq. inch, in addition to the normal pressure of air; and to supply this addition, 13 large compressors were used. The earliest caissons for such purposes were used in England in 1738–40 in laying the foundations of the Westminster bridge over the Thames.

CAITH'NESS, a maritime co., the most northerly on the mainland of Scotland. It is triangular in shape; length, from n. to s., 40 m.; greatest breadth, 30 m.; area, 712 sq. miles. Except in the w. and s., where the mountain-range (composed of granite and gneiss) dividing C. from Sutherland attains, in its highest point, a height of more than 2300 ft., the general aspect of C. is level and bare, being in great part moorland and destitute of trees, while the sea-coast is bold and rocky, with many bays, inlets, promon-

tories, and caves. On the n. coast are Dunnet head and Duncansby head; and on the w. side of the last-named head is a spot of green turf, called John o' Groat's house, where John de Groot or Groat of Warse settled with his brothers in James IV.'s time, and built a house. There are no navigable rivers in C., and no lakes of importanee. The elimate is damp and chilly, but snow rarely lies on the plains above a day or two at a time. Thunder is rare, but auroræ are seen almost nightly. There are no manufactures, properly so called, although weaving is carried on to some extent. Coal has not been found in C.; the eommon fuel is peat. The chief erops are oats, bear, turnips, and potatoes. The parts of the surface under tillage are generally a deep fertile loam on a strong till elay. In the n.e., the soil is sandy. The erops are 20 days later in ripening than in the Lothians. The oecupants of many of the small farms divide their time between farming and fishing. There are herring, ling, eod, salmon, and lobster fisheries. The herring-fishery in July and August employs about 1500 boats, a part of which come from other parts of the Scotch eoasts. Wick is the chief seat of the British herring-fishery. The average number of barrels cured annually in the ports of C. may be stated at 200,000. The other exports are cattle, oats, wool, and flag-stones, of which, as well as of freestone and slate, C. eontains quarries. Wick is the only parliamentary borough in C.; another town is Thurso, an old burgh of barony. There were, when the census was taken in 1871, 7185 ehildren in C., and of these, 6608 were receiving education. Pop. 39,992. The county returns one member to parliament, and Wick unites with Kirkwall, Dornoek, Dingwall, Tain, and Cromarty, in returning another. A railway, eompleted in 1874, and extending to Wick and Thurso, eonnects C. with the south. In early times, C. is supposed to have been inhabited by Celts; these afterwards mixed with Danes and Norwegians. C., in the middle ages, was subject to the kings of Norway. David II. adopted the weights and measures of C. for all Seotland. The Seandinavian origin or mixture of the people of C. is shown by their tall forms and soft fair features, and their speaking English instead of Gaelic. C. has remains of Piets' houses, round towers, etc. Pop. '81, 38,865.

CAITH'NESS FLAGSTONES are dark-eolored bituminous schists, slightly micaeeous and calcareous, valuable on aceount of their great toughness and durability for pavements, cisterns, and various other purposes, and accordingly are largely exported. They belong to the old red sandstone, and eontain abundant remains of fossil fishes.

CAIUS, Dr. JOHN, the person from whom Caius eollege, Cambridge, takes it name, was b. at Norwieh in 1510. His real name was Kaye or Key, whieh he Latinized into Caius. He was educated at Gonville hall, university of Cambridge; and at the age of 20, turned into English Chrysostom's *Method of Praying to God*, whieh was followed by a translation of Erasmus *On True Theology*. He next went abroad, and resided in Italy for several years, studying medicine. On his return to England, he praetieed with success at Cambridge, Shrewsbury, and Norwich. Henry VIII. appointed him anatomieal lecturer to the company of surgeons in London. In 1547, he was elected a fellow of the college of physicians, of whieh he was subsequently made president. He also became physieian to Edward VI., queen Mary, and queen Elizabeth. In 1557, he obtained permission to elevate Gonville hall into a college, whieh took the name of Caius college, and of which he beeame master. This offiee he held till his death, in July, 1573. His principal work is *A Boke or Counseill against the Disease commonly called the Sweate or Sweatyng Sicknesse, Anno Do.* 1552. C., however, wrote a great number of works on a variety of subjects, critical, antiquarian, and scientific.

CAIUS COLLEGE. See GONVILLE AND CAIUS COLLEGE.

CAIVA'NO, a t. of southern Italy, in the provinee of Naples, and 8 m. n. of the city of that name. It was a place of considerable strength in the middle ages, and still retains many remains of its walls and towers, though they have suffered severely in the various revolutions of Naples. Pop. 10,000.

CAJAMAR'CA. See CAXAMARCA, *ante.*

CAJATAM'BO, a province in the department of Junin, Peru; 1500 sq.m.; pop. 24,750. The region is mountainous and eomparatively barren, with a severe climate. There are many remains of aneient towns, aqueduets, etc. The ehief town, of the same name, has a pop. of about 3200, and is in a fertile plain at the foot of the Andes, 140 m. n.n.e. of Lima. The people are employed in spinning wool for sale at Lima.

CA'JEPUT, *Melaleuca cajeputi* or *M. minor*, a tree of the natural order *myrtaceæ*, sub-order *leptospermeæ*, from the leaves of which the pungent, aromatie, volatile oil, called *oil of cajeput*, is obtained by distillation. The C. tree is common on the mountains of the Moluccas. It is rather a small tree, with a crooked trunk, thick spongy bark, white wood (whence the name C., properly *kayuputi*, signifying white wood), elliptical-lanceolate alternate leaves, and terminal spikes of white flowers. The greater number of the species are natives of Australia, some of them very beautiful shrubs and frequent ornaments of British hot-houses. Much of the oil of C. of commerce is prepared in the island of Banda. It is said that two sackfuls of leaves yield scarcely three drams of the oil, which is green, transparent, limpid, with a strong penetrating odor, and agreeable only when much diffused.

CAJ'ETAN, or GAETANI, BENEDETTO. See BONIFACE VIII., *ante.*

CAJ'ETAN, Tommaso de Vio, 1469–1534; an Italian priest of the Dominican order, and the general of that order. In 1517, Leo X. sent him as legate to induce Maximilian of Germany to join in the league against the Turks, and especially to bring the Lutherans back to allegiance to the church; but C.'s arrogant manner defeated the purpose for which he was sent. When Rome was taken by the imperialists in 1527, he was made a prisoner, but he bought his freedom for 5000 crowns. He made a translation of the Old Testament with commentary, and wrote a treatise on the authority of the pope which was answered by the faculty of the university of Paris.

CALABAR', the name of a coast district of upper Guinea, Africa, the limits of which are not clearly defined; but it is usually understood to extend between the river Benin and New Calabar, called by the Portuguese Rio del Rey, and as far n. as the Kong mountains. The surface is low and flat, and the climate unhealthy. Yams, which are the principal food of the inhabitants, are raised in plenty, and also the sugar-cane, and palms, from which palm-oil is obtained in large quantities. The inhabitants are polygamists, and make human sacrifices to good and evil spirits. The United Presbyterians have had a mission here since 1846, which is beginning to produce beneficial changes.

CALABAR (Old), a river of this district, enters the bight of Biafra, about 52 m. w.n.w. of Fernando Po, by an estuary about 9 m. in breadth. It is navigable by steamers for about 200 m. above its mouth, and abounds in crocodiles. The chief towns on its banks are—Duke Town, situated on its estuary; Creek Town, further up, both seats of British missions; Acoono Coono, and Omun.—Calabar (New), a branch of the Niger, falling into the Bight of biafra, in lat. 4° 30′ n., and long. 7° 7′ e. It has a bar across its mouth, which prevents the entrance of vessels drawing more than 12 ft.; but some miles up it has an average depth of 30 feet.

CALABAR BEAN, a very remarkable medicinal agent, which has been introduced into the new edition of the British Pharmacopœia (1867). It is the seed of *physostigma venenosum*, a twining, half-shrubby plant, a native of western Africa, of the natural order *leguminosæ*, sub-order *papilionaceæ*, nearly allied to the kidney bean, but of a genus distinguished by the hood-shaped stigma, and the deeply-furrowed hilum of the seed. The following are the leading characters of the bean itself: "About the size of a very large horse-bean, with a very firm, hard, brittle, shining integument, of a brownish-red, pale chocolate, or ash-gray color. Irregularly kidney-shaped, with two flat sides, and a furrow running longitudinally along its convex margin, ending in an aperture near one end of the seed. Within the shell is a kernel, consisting of two cotyledons, weighing on an average about 46 grains, hard, white, and pulverizable, of a taste like that of the ordinary edible leguminous seeds, without bitterness, acrimony, or aromatic flavor. It yields its virtues to alcohol, and imperfectly to water." It is used in the form of an emulsion by the natives of Africa, as an ordeal when persons are suspected of witchcraft. About twenty years ago, Dr. Christison very nearly fell a victim to his zeal for science in experimenting on some specimens of this bean which had been sent to Edinburgh by some African missionaries, dangerous symptoms having been produced by 13 grains of the kernel which he swallowed. In 1861, Dr. Thomas R. Fraser tried the effects upon himself of doses of 6, 8, and 10 grains. The general symptoms were epigastric uneasiness, great feebleness, dimness of vision, salivation, giddiness, and irregular, feeble, and slow heart's action. About the same time, he made the interesting discovery, that when placed on the eyeball this substance contracts the pupil, and produces near-sightedness; and it is now frequently employed for these purposes by ophthalmic surgeons. In 1864, 50 children were poisoned by eating these beans, which were swept out of a ship at Liverpool. A boy aged six years, who ate six beans, died very speedily. The chief symptoms in these cases were griping, vomiting, and contracted pupils; the face was pale, the eyes bright and protruding, and in trying to walk, the children staggered as if they were drunk. Dr. Fraser, in a paper which he communicated to the royal society of Edinburgh in 1866, maintains that, in mammals, death is generally produced by a combination of syncope (faintness) with asphyxia (suffocation); the symptoms of the one or the other depending on the dose, which, when large, at once destroys the heart's action. It has been used medicinally in small doses (one to ten grains of the powder, or $\frac{1}{16}$ to $\frac{1}{8}$ of a grain of the extract) in chorea, tetanus, general paralysis of the insane, and other diseases of the nervous system. Being now a recognized medicinal agent, it is satisfactory to know that the dangerous and even fatal effects of excessive doses may be prevented by administering belladonna, (night-shade), or its active principle, atropia, as a counter-poison. This fact has been established by Dr. Fraser in a communication to the royal society of Edinburgh, embracing the results of 500 experiments on dogs and rabbits. So unmistakable is the power of the antidote, that it can prevent even three times a fatal dose of the kernel from causing death in those animals. Belladonna has also an opposite action on the eye to that of this substance, as it dilates the pupils and produces long-sightedness. When the pupil is contracted by Calabar bean, it may be dilated to its normal, or to a greater, size by belladonna; and when it is dilated by belladonna, it may be reduced to its normal, or to a less, size by Calabar bean.

CALABASH TREE, *Crescentia cujete*, a tree found in the West Indies and in the

tropical parts of America, of the natural order *bignoniaceæ* (q.v.) suborder *crescentiaceæ*. In height and size it resembles an apple-tree, and has wedge-shaped leaves, large whitish fleshy flowers scattered over the trunk and older branches, and a gourd-like fruit, sometimes a foot in diameter. The wood of the tree is tough and flexible, and is well adapted for coach-making. But the most useful part is the hard shell of the fruit, which, under the name of *calabash*, is much used in place of bottles for holding liquids, and for goblets, cups, water-cans, etc. These shells may even be used as kettles for boiling liquids, and they will bear this several times without being destroyed. They are sometimes highly polished, carved with figures, tinged with various colors, and converted into ornamental vessels. The rinds of gourds are sometimes similarly used, and called calabashes.

CA'LABA TREE. See CALOPHYLLUM.

CALABO'ZO, a t. in Venezuela, 120 m. s.s.w. of Caracas, in the plain w. of the river Guarico; pop. 6000. It is an important point for commerce, but is subject to inundations and extremes of heat. The town has a college and a number of schools.

CALA'BRIA, the s.w. peninsula of the kingdom of Italy, bounded n. by the province of Basilicata. Its greatest length, from the southern border of Basilicata to cape Spartivento, is about 160 miles. In its northern part it has a breadth in some places of more than 60 m., which suddenly contracts, between the gulfs of Sant' Eufemia and Squillace, to not more than 16. Its entire area is nearly 7000 sq.m., and its pop., in 1871, amounted to 1,206,302. It is traversed throughout its entire length by the Apennine mountains (q.v.), whose summits in the region in the n. of C., known as La Sila, and the Aspromonte, in the s., are crowned with pines, while forests of oak and beech cover their sides. The valleys between the various hills afford rich pasture, especially in the n., to which, in spring-time, whole colonies migrate with their flocks and herds. There is no river of any importance in C.; but the valleys and plains, watered by such streams as there are, are very fertile, yielding wheat, rice, cotton, licorice, saffron, the sugar-cane, etc., and also the vine, orange, lemon, olive, fig, and mulberry, in luxuriance. Iron, alabaster, marble, gypsum, and antimony are among its minerals. The fisheries of its coasts, particularly the tunny and anchovy fisheries, are important, and afford employment to a large number of the population. Manufactures are in a backward state. Silk is the staple article. The district is very subject to earthquakes. For purposes of administration, C is divided into the provinces of Cosenza, which has a population of 440,468—capital, Cosenza; Catanzaro, with a population of 412,226—capital, Catanzaro; and Reggio, with a population of 353,608—capital, Reggio.

In ancient times, the name C. was given to the s.e. peninsula, nearly corresponding to the modern province of Lecce, no portion of which is included in modern C., which answers to the ancient *Bruttium*. The name C., as applied to the district now known by that name, appears to have originated with the Byzantines some time prior to the conquest of the country by the Normans. A colony of the Vaudois or Waldenses of Piedmont was founded in C. in 1340, and for some time enjoyed great prosperity, but was extirpated in 1560–61. The destruction of this colony is one of the blackest passages of the history of religion in Italy.

The Calabrians are a proud, fiery, and revengeful race. They were long celebrated as among the fiercest of banditti; but the crimes which in former times made them infamous are no longer frequent. They strenuously resisted the power of France during the Napoleonic campaigns, and were not finally subdued until 1810.

CALA'DIUM. See Cocco.

CALAHOR'RA, a t. in Spain in the province of Logroño, 24 m. s.e. of the city of that name, is situated on the small river Cidacos, about 2 m. from its confluence with the Ebro. C. occupies the site of the ancient *Calagurris*, celebrated in classic history for the obstinate but unsuccessful resistance it offered (78 B.C.) to Afranius, Pompey's legate, when the citizens slaughtered their wives and children for food rather than surrender. C. was the birthplace of Quintilian the rhetorician. It has an old cathedral, and a trade in the agricultural produce of the rich district in which it is situated. Pop. about 7000.

CALAIS, a city and port of entry in Washington co., Me., on St. Croix river at the head of tide water, and opposite to St. Stephen in New Brunswick; the most northeasterly seaport in the United States; 75 m. n.n.e. of Bangor; pop. '80, 6173. The river is crossed by several bridges, and the New Brunswick and Canada railroad touches at St. Stephen. The St. Croix and Penobscot railroad from C. to Bangor is partially built. There is a tide at C. varying from 20 to 30 ft. and steamers of the largest size come and go freely. The St. Croix also furnishes abundant water-power, to which is due the great lumber trade of the city. Nearly 100 mills are engaged in making boards, laths, shingles, etc. Ship-building is also an extensive business, and there are founderies, machine shops, and dry dock, flour mills, and many other branches of mechanical industry. Among the chief buildings are a city hall, an opera house, and a dozen churches. The city was nearly destroyed by fire in Aug., 1870, since which time it has been rebuilt in a more substantial manner.

CALAIS, a seaport t. of France, in the department of the Pas-de-Calais, on the strait of Dover, near its narrowest part, the distance from the town of Dover not being more

than 26 miles. There is here a lighthouse 190 ft. high. In 1879, it was determined to encircle C. with vast new fortifications, and make it once more a fortress of the first class. On the s. and e., low marshy grounds, which those in the city have the means of submerging, stretch up almost to the walls. The town, adjacent country, and port are commanded by the citadel, which is situated at the w. end of the town, while numerous forts, by their cross-fire, defend the weakest points. The harbor, which is nearly dry at low tide, and which has rarely more than from 15 ft. to 18 ft. of water in it, is formed by two moles, which project about three quarters of a mile into the sea. Being one of the chief ports of debarkation for travelers from England to France, it has daily steam communication with Dover—with which it is also connected by submarine telegraph—and with London and Ramsgate several times a week. The city, which is entered from the sea by a drawbridge and gate, erected in 1685 by cardinal Richelieu, is square in form; its streets are, for the most part, broad and well paved; and its ramparts form pleasant promenades. But it is on the whole a dull place. It has few objects of interest, the most noticeable being the cathedral, with a fine picture of the "Assumption" by Vandyck. It has become a manufacturing town of some importance. The chief manufactures are bobbin-net (tulle) and hosiery. Numerous mills have been built; steam-engines are multiplying; and the inner ramparts have been removed to make room for factories. Hats and gloves are extensively made. It has also distilleries, salt refineries, and ship-building. C. sends many boats to fish for herring and cod on the coasts of Scotland and Iceland. Water, which used to be scarce, is now brought in abundance from the neighborhood of Guines. Its exports consist of eggs, corn, wine, brandy, etc. In 1873, a school of artillery was established in C. Pop. '76, 12,573.

In the 9th c., C. was but a small fishing-village. In the following c., it was much improved by Baldwin IV., count of Flanders, and enlarged and strengthened by Philippe of France, count of Bologne. After a long siege, it was captured by Edward III. of England, whose hard terms, and the self-devotion shown by six of the citizens, who were saved by queen Philippa, form one of the most interesting passages of history. The English retained it until 1558, when it was captured by the duke of Guise, since which time (with the exception of two years, 1596–98, when it was in the possession of the Spaniards) it has remained in their hands. In 1659, Charles II. of England resided some time here; and about a quarter of a century later, James II. arrived here with French troops for the invasion of England, which the destruction of the French fleet prevented him from accomplishing. Louis XVIII. landed here in 1814, after his exile.

CALAMANDER WOOD, a cabinet-wood, of the greatest value, resembling rose-wood, but much surpassing it in beauty and durability. The tree which produces it is *diospyros hirsuta* (see DIOSPYROS), a species of the same genus which produces ebony; it has oblong obtuse leaves, which are downy beneath, and flowers without stalks and crowded; and is a native of the s.e. of India, and of Ceylon, particularly of the forests at the base of Adam's Peak. But this tree "has been so prodigally felled, first by the Dutch and afterwards by the English, without any precaution for planting or production, that it has at last become exceedingly rare," so that wood of considerable size is scarcely to be procured at any price. It yields veneers of unusual beauty, "dark wavings and blotches, almost black, being gracefully disposed over a delicate fawn-colored ground." Its density is very great, a cubic foot weighing nearly 60 lbs., and it takes an exquisite polish. The name C. W. is supposed to be a corruption of coromandel wood.

CAL'AMARY, SQUID, or SLEEVE-FISH, *Loligo*, a genus of cephalopodous mollusks of the order *dibranchiata*, and family *teuthidæ*. The body is of an elongated form, firm, fleshy, tapering, and flanked towards its posterior extremity by two triangular fins. The body contains a *gladius*, or internal shell, which is horny and flexible, narrow, and pen-shaped, with the shaft produced in front. The mouth is furnished with eight arms. Calamaries have the power of diffusing a dark-colored fluid around them in the water like the cuttle-fish. The different species are distributed over all parts of the world. Several are found in the British seas. In some seas, however, they abound much more, and form a principal part of the food of some of the larger fishes and of whales. The common C. or squid (*L. vulgaris*) is of a bluish color, speckled with purple. It grows to nearly a foot and a half in length, without reckoning the head and arms, which add to the length about half a foot more. See CEPHALOPODA.

CALAMAT'TA, LUIGI, 1802–69; b. in Milan; an engraver who became famous by an engraving of the head of Napoleon taken after his death at St. Helena: and also for an engraving of Ary Scheffer's "Franeesca da Rimini." His widow, Josephine, is a painter of religious subjects.

CALAM'BUCO, a tree found only in the n. part of the island of Luzon, considered superior to teak or live oak for shipbuilding. It is dark and hard, like teak, and is proof against the destructive white ant of the Malay region. Warlike, mechanical, and agricultural tools and implements are made from it. The same name applies to the tree that furnishes the eagle-wood and aloes-wood of commerce, found in Siam and Sumatra. The resin which it yields, is supposed to be produced by some disease in the tree, and is used in eastern countries for incense.

CALAMIA'NÉS, a group of islands in the Eastern archipelago, in lat. about 11° 25′ to 12° 20′ n., and long. 120° east. Calamianes, the name of the largest of the group, is

about 35 m. long, and 15 m. broad, elevated and fertile, with abundance of animals, such as deer and hogs. The group, with the northern part of Palawan, forms the Spanish province of C., the poorest in the Philippines.

CALAMICH'THYS, a cylindrical and extremely slender ganoid fish in the waters of w. Africa, allied to the polypterus of the Nile.

CAL'AMINE, an ore consisting essentially of carbonate of zinc. The name is said to be derived from the Greek and Latin *calamus,* a reed, because when fused it adheres to the base of the furnace in a reed-like form. Its primary form is a rhomboid, and it occurs in small obtuse-edged crystals, also compact and massive. It is white, yellowish-white, brown, green, or gray; is sometimes opaque, sometimes translucent; is brittle, and has an uneven conchoidal fracture. It occurs in beds and veins in rocks of various kinds, but most commonly in limestone. Mendip, Matlock, Alston Moor, Leadhills, and Wanlockhead are British localities. C. is an important ore of zinc. In the duchy of Limburg, in the Netherlands, about 1,500,000 lbs. of it are annually extracted from the mines.

CAL'AMINT, *Calamintha,* a genus of plants of the natural order *labiatæ,* nearly allied to balm (q.v.) (*melissa*). The COMMON C. (*C. officinalis,* formerly *melissa calamintha*) is not unfrequent in England. It has whorls of flowers (*verticillasters*), on forked many-flowered stalks, and serrated leaves, with an agreeable aromatic odor, not unlike that of some kinds of mint. It is used by the country people to make herb-tea, and as a pectoral medicine.—The LESSER C. (*C. nepeta*), also an English species, is used in the same way.

CAL'AMIS; 467–429 B.C.; a sculptor of Greece, who made statues in bronze, ivory, gold, and marble; also famous for his representations of horses.

CAL'AMITE, a genus of fossil plants whose true position has not been satisfactorily ascertained. They appear first in the Devonian rocks, and rise through the intermediate formations to the oolitic series, where they are represented by a single species. They reach their culminating point in the coal-measures, where 39 species have been determined. The tall straight stems rose from a swampy clay soil in profusion in the forests of sigillaria, and formed a striking and characteristic feature in the coal flora, though they supplied little material for the structure of coal. They are hollow-jointed cylinders, with longitudinal furrows, giving the fossil the appearance of *equiseta;* from this resemblance, botanists have generally considered them as huge "horsetails." Hooker has been unable to detect any traces of structure, in carefully prepared specimens, or the presence of those siliceous stomata which characterize *equiseta,* and which would have been preserved in the fossil state, and Fleming has shown that the furrows are markings on the interior cavity. While, therefore, it is certain that they are not "horsetails," the absence of fructification makes every attempt to give them their position but guess-work. Hooker supposes them nearly allied to ferns, or club-mosses; Brongniart ranks them among gymnospermous dicotyledons. The upper part of the stem, and the foliage, if any, have not been noticed. The root termination was conical, the joints decreasing downwards in size and length. From the scars on the upper portion of each joint, there proceeded filaments, which were supposed to be leaves, but are really roots. These are shown in the species figured—a species common in the English coal-field.

CAL'AMUS, the reed pen which the ancients used in writing, was made of the stem of a reed growing in marshy places, probably *arundo donax* (see REED), of which the best were obtained from Egypt. The stem was first softened, then dried, and cut and split with a knife (*scalprum librarium*), as quill pens are made. To this day, the orientals generally write with a reed, which the Arabs also call *kalâm.*

CALAMUS, a genus of palms. See RATTAN and DRAGON'S BLOOD.

CALAMUS, a name sometimes given to the sweet flag (*acorus calamus*). See ACORUS. See also next article.

CAL'AMUS AROMAT'ICUS, the name given by the ancients to a plant to which they ascribed important medicinal virtues. It is by no means ascertained what the plant is: the most probable opinion appears to be that of Dr. Royle, who supposes it to be one of the sweet-scented grasses which yield the grass-oil (q.v.) of India, to which he has given the name of *andropogon calamus aromaticus.* See LEMON-GRASS. The C. A. of the Greeks and Romans came from the east. The *sweet calamus* and *sweet cane* mentioned in Scripture (Exod. xxx. 23, and Jer. vi. 20) are probably the same with the calamus aromaticus.

CALAMY, EDMUND, an eminent English divine, was b. in London, 1600; studied at Pembroke hall, Cambridge, where he attached himself to the Calvinistic party; and afterwards became domestic chaplain to the bishop of Ely. In 1626, he was appointed lecturer at Bury St. Edmunds, but resigned his office when the order to read the *Book of Sports* began to be enforced. In 1639, he was chosen minister of St. Mary's, Aldermanbury, London. He now entered warmly into the controversies of the time, and became noted as a leading man on the side of the Presbyterians. He had a principal share in the composition of *Smectymnus,* a work intended as a reply to bishop Hall's

Divine Right of Episcopacy, and one of the most able and popular polemics of the day. Like the mass of the Presbyterian clergy, he was monarchical and not republican in his political opinions. He disapproved, therefore, of the execution of Charles, and the protectorate of Cromwell, and did not hesitate to avow his attachment to the royal cause. He was one of the deputies appointed to meet Charles II. in Holland, and congratulate him on his restoration. His services were recognized by the offer of a bishopric, which he refused from conscientious scruples. The increasing tyranny and intolerance of the high church party compelled him give up even his royal chaplaincy. He died Oct. 29, 1666.—Two of his sons were educated for a religious profession: the one, Dr. BENJAMIN C., became a high churchman, and wrote *A Discourse against a Scrupulous Conscience;* the other, EDMUND C., was ejected for non-conformity, and had a son, also named Edmund, who acquired some reputation as the biographer of the ejected clergy.

CAL'AMY, EDMUND, D.D., 1600–1666; an English non-conformist clergyman, who arranged for the press *Baxter's Life and Times*, and wrote *Defense of Modern Non-conformity; The Non-conformists' Memorial;* and published many sermons.

CALAND, or KALAND, a brotherhood of Roman Catholics devoted to charitable and devotional works, dating from the 13th c., and of considerable extent in Germany, Switzerland, and France. It degenerated so far that it was suppressed before the reformation, its property being confiscated for public purposes.

CALAND, PIETER, b. Holland, 1826; an engineer, and son of an engineer; author of works on encroachments of the sea, and the effect of the sea on rivers; but better known for his improvements in the communication of Rotterdam with the ocean, whereby he replaced a tortuous and difficult route by one easy and direct.

CALAN'DO, in music, an Italian expression, meaning diminishing by degrees from forte to piano; it differs from the decrescendo or diminuendo, as the tempo, at the same time, is slightly retarded, but not so much as in ritardando. The proper performance of the C. is purely a matter of good taste and feeling, depending on the performer.

CALAN'DRA. See CORN WEEVIL.

CALANDRONÉ', a wind-instrument used by the Italian peasants, on which they play simple melodies, and also sometimes accompany their national songs. It has the holes of the common flute, but the intonation is produced as in the common pipe.

CALA'NUS, a Hindu philosopher, whose real name, according to Plutarch, was Sphines. He was for some time in the camp of Alexander the great, but having become seriously ill, he was burned alive at his own request.

CALAS, JEAN, a Frenchman, remembered as the unhappy victim of fanaticism and the shocking maladministration of justice, was b. at Lacaparède, in Languedoc, Mar. 19, 1698. He lived as a tradesman in Toulouse, where he had a very good reputation. One evening after supper (Oct. 13, 1761), the eldest son of the C. family, Marc Antoine, a youth addicted to gambling, and subject to fits of deep melancholy, was found hanged in the warehouse. There was not a shadow of a reason for doubting that the unhappy young man had committed suicide; but popular rumor accused the father, or other members of the C. family, of murdering the eldest son, "because he had contemplated conversion to Catholicism." It was also asserted that a young man named Lavaysse, who was in the house on the fatal evening, had been dispatched "by the Protestants of Guyenne to perpetrate the murder." The clergy exerted all their influence to confirm the populace in their delusion. At Toulouse, the White Penitents celebrated with great solemnity the funeral of the young man, and the Dominican monks erected a scaffold and placed upon it a skeleton, holding in one hand a wreath of palms, and in the other an abjuration of Protestantism. The family of C. was, in consequence of the popular excitement, brought to trial for the murder, and several deluded and (most probably) some bribed witnesses appeared against them. A Catholic servant-maid, and the young man Lavaysse, were also implicated in the accusation. C., in his defense, insisted on his uniform kindness to all his children; reminded the court that he had not only allowed another of his sons to become a Catholic, but had also paid an annual sum for his maintenance since his conversion. He also argued from his own infirmity that he could not have prevailed over a strong young man, and referred to the well-known melancholy moods of the deceased as likely to lead to suicide; and, lastly, he pointed out the improbability that the Catholic servant-maid would assist in such a murder. But all his arguments proved unavailing, and the parliament of Toulouse sentenced the wretched man—by a majority of 8 votes against 5—to torture and death on the wheel! With great firmness and protestations of his innocence to the last, the old man died on the wheel, Mar. 9, 1762. His property was confiscated. His youngest son was banished for life from France, but was captured by the monks, and compelled to abjure Protestantism. The daughters were sent to a convent. The young man Lavaysse was acquitted, and the widow of C. escaped into Switzerland, where she was so fortunate as to excite the benevolent interest of Voltaire, who brought the whole affair before the public, and, in his book *Sur la Tolérance*, proved that C. had fallen a victim to religious hatred and popular fanaticism. A revision of the trial followed, and, after

full investigation, the parliament at Paris declared (Mar. 9, 1765) C. and all his family innocent. Louis XV. gave to the bereaved family the sum of 30,000 livres; but, strange to say, neither the parliament of Toulouse nor the fanatical monks were ever brought to account for this horrible judicial murder!

CALASA'YA BARK. See CINCHONA.

CALASCIBET'TA, or CALATAS-CIBETTA (Saracenic = Castle of Xibeth, or Scibet), a t. of Sicily, near its center, 54 m. s.e. of Palermo, in the province of Caltanisetta. The town is mean and dismal looking, and is built on a steep and isolated height, the summit of which is 2570 ft. above the sea, and commands a magnificent view. It was founded in 1080. The only object worthy of notice is the tower of the principal church, which is of early architecture. Pop. 5600.

CALASIA'O, a t. on the island of Luzon (Philippines), with a population of 18,000, who are engaged in the manufacture of straw hats, cigar cases, etc.

CALA'SIO, MARIO DE, 1550–1620; an Italian scholar, doctor of theology and professor of Hebrew in Rome, who made a Hebrew dictionary and grammar. He devoted 40 years of his life to a great work called *Concordantiæ Sacrorum Bibliorum Hebraicæ,* which was published after his death.

CALASPAR'RA, a t. of Spain, in the province of Murcia, 40 m. n.w. of the city of that name. The inhabitants, numbering 5275, are chiefly engaged in agricultural pursuits.

CALATABELLO'TA, a t. of Sicily, in the province of Girgenti, and 27 m. n.w. of the city of that name. In the immediate vicinity is the site of the ancient *Triocala,* the chief fortress of the insurgents in the second Servile war, 103 to 100 B.C. Pop. about 6000.

CALATAFI'MI, a t. of Sicily, in the province of Trapani, situated 8 m. s.w. of Alcamo, in a very fertile district. It is ill-built, and has a ruinous old Saracenic castle, Kalat-al-Fimi, from which it derives its name. There is a remarkable Mosaic altar in the church of Santa Croce. Here, in 1860, Garibaldi's troops defeated the Neapolitan soldiers. Pop. 9500.

CALATAGIRONE', or CALTAGIRONE', a city of Sicily, in the province, and 34 m. s.w. of the city, of Catania. It is well built, with wide streets, and has the fame of great wealth. It has manufactures of cotton fabrics and pottery. Pop. '72, 25,978.

CALATANAZOR', a t. of Aragon, Spain, about 10 m. s.w. of Soria. It is celebrated for a great victory over the Christians obtained by Al-Mansur in 1001. Pop. 1500.

CALATAYUD', a city of Aragon, Spain, situated on the Jalon, near its junction with the Jiloca, about 48 m. s.w. of Saragossa. It is built at the base of two rocky ridges, and out of the ruins of ancient *Bilbilis,* which lay about 2 m. to the east. The city is divided into a new and old portion, the former of which is composed of mean old buildings. The latter has some good streets and handsome squares. C. has a noble old castle, and among its other most noteworthy public edifices are the two collegiate churches and the Dominican convent. In the neighborhood are some curious stalactitical caves. It has manufactures of linen and hempen fabrics, woolens, paper, leather, etc., and a trade in agricultural produce. Pop. 11,037.

CALATRA'VA, an order of knighthood in Spain, instituted at Calatrava (q.v.). The statutes of the order, framed by the chapter-general of the Cistercian monks, were sanctioned by the bishop of Toledo in 1164, and afterwards by the pope. At subsequent periods, many privileges were added. After the death of the king, their patron, some of the knights were no longer willing to obey the abbot, and they consequently separated themselves from the monks, and elected a grand-master, Don Garcias de Redon. At a later period, they again united themselves to the Cistercians, after they had gained rich possessions from the Moors both in Spain and Portugal. When Castile had fallen into anarchy, and the other kingdoms were exhausting themselves by internal feuds, the war against the unbelievers was almost entirely carried on by the knights of Calatrava. Their almost uniform success, however, gave rise to rashness; the knights were defeated by emir Jacob ben Yuseff, nearly all of them perished, and Calatrava was occupied by the Moors. After this disaster, the knights transferred their seat to the castle of Salvatierra, by the name of which they passed for a long time afterwards. A truce of 12 years having been concluded, during which the order revived, the knights were able, at the battle of Las Navas de Tolosa, in 1212, again to turn the tide in favor of the Christians. They then returned to Calatrava. Notwithstanding their splendid achievements, the knights of C. never possessed the vast wealth of their brethren of St. James of Compostella (q.v.), a fact which is probably to be accounted for by their having ceded a part of their conquests to the orders of Alcantara and Aviz. But their grand-masters, who were chosen from the highest families in Spain, were very powerful, and exercised a vast influence on public affairs. They did not, however, escape the jealousy of the crown. Two of them were accused of treason, and died on the scaffold; and on the death of the 13th grand-master, in 1489, the administration of the order was transferred to the king by a bull of pope Innocent VIII. By way of compensation for the loss of their independence, the knights were permitted to marry once, though they were still bound to

make vows of poverty, obedience, and conjugal chastity; and latterly to profess belief in the immaculate conception. Their original costume consisted of a coat of white mail, with a white scapulary, a black cap, and a pilgrim's hood; but this dress the anti-pope Benedict XIII., in 1397, granted them permission to exchange for a civil apparel. Their present costume is a white mantle, with a red cross cut out in the form of lilies upon the left breast; while the cross of the order has the same symbol on a silver ground. Two convents for nuns were attached to the order, and were at one time richly endowed. The nuns, attached to the order of C. in 1519, wore the dress of Cistercian nuns, with the cross of the order on the left side of the capoch, fastened to the scapulary.

CALATRAVA LA VIEGA, a ruined city of Spain, situated on the Guadiana, about 12 m. n.e. of Ciudad Real. In the middle ages it was a strongly fortified place, but nothing now remains but a single tower. Its defense against the Moors, undertaken by Raymond, abbot of Fitero, and Diego Velasquez in 1158, after it had been abandoned by the Templars, is famous on account of its having originated the order of the knights of Calatrava, long one of the most honorable in Spain. The town was called C. la Viega, or Old Calatrava, in order to distinguish it from the convent of the knights of the order of Calatrava, erected in the neighborhood in 1214, and which was called Calatrava la Nueva.

CALAVE'RAS, a co. in n. California, on the Calaveras, Stanislaus, and Mokelumne rivers, and the Stockton and Copperopolis railroad; 936 sq.m.; pop. '80, 9094—1037 Chinese. Gold and copper mining are the leading occupations, with agriculture. The grove of big trees is in this county. Co. seat, San Andreas.

CALAVE'RAS, a river in n. California, running from the Sierra Nevada w. to the San Joaquin, on the border of Sacramento county.

CALBUR'GA, a t. of the Nizam's dominions in Hindustan, about 110 m. to the w. of Hyderabad. It stands on a tributary of the Beemah, which is itself a tributary of the Kistna or Krishna. It has been successively the capital of Hindu and Mohammedan sovereignties.

CALCAIRE GROSSIER (Fr. "coarse limestone"), the French representative of the Bracklesham eocene beds. It consists of compact limestones, with seams of chert, and intercalated marls and freestones. The fossils are fresh water and marine mullusca; so abundant are they that in one spot near Grignon no less than 400 distinct species have been procured. Associated with the fresh-water remains are the bones of reptiles and mammalia.

CALCAIRE SILICEUX (Fr. "siliceous limestone") is the French representative of the Bembridge eocene strata. These compact siliceous limestones extend over a wide area in the Paris basin. The few fossils they contain are fresh water and land shells.

CALCAREOUS, in chemistry, is a term applied to substances containing much lime (Lat. *calx*). Thus, *C. waters* are those which hold in solution much carbonate and sulphate of lime, and which are generally known as hard waters, and form a deposit in kettles and other vessels when heated therein. *C. rocks* are those in which lime forms the prevailing element. They may be chemically formed as in the case of tufas, where a saturated solution of carbonate of lime in water is deposited from evaporation or other causes; but they are generally aqueous rocks, the materials of which are supplied by animal remains. Thus, many rocks, like the mountain-limestone, are composed of shells, corals, and encrinites; while others, like chalk, consist of foraminifera and fragments of other minute testacea. A crystalline structure, varying in degree from the partially crystallized carboniferous limestones to the saccharine statuary marble, is produced in calcareous rocks by metamorphic action. Oolite is a variety of limestone composed of small egg-like grains resembling the roe of fish. The existence of lime in rocks can always be detected by the application of dilute nitric or muriatic acid, when it effervesces from the liberation of the carbonic acid. Pure lime is obtained from calcareous rocks by calcining them—i.e., by driving off the carbonic acid and other volatile matter by heat.—*C. soils* are produced from the disintegration of calcareous rocks. When the rocks are perfectly pure, they generally yield barren soils, as in many chalk and limestone districts of Britain; but when the lime is mixed with clay, so as to form marl, and has a little vegetable matter added, it forms an excellent though rather light soil. Calcareous soils are difficult of drainage, owing to the property that soft lime has of retaining water, although it easily yields it up by evaporation. Such soils are consequently soon dry at the surface after rain, but yet rarely suffer severely from drought.

CALCAREOUS SPAR, or CALC-SPAR, the name usually given by mineralogists to carbonate of lime, rhombohedral in its crystallization. It differs from arragonite only in crystallization. See ARRAGONITE. C. S. occurs in all geological formations, and is one of the most abundant of all minerals. It often completely fills cavities in rocks; and although it has been prevented by want of space from assuming a crystalline form is readily divided by the knife and hammer into rhomboids, the primary form of its crystals being a rhomboid, of which the greatest angles are 105° 5′. Its secondary forms are more numerous than those of any other mineral. More than 700 have been observed. One of the most common, a rather elongated pyramid, is sometimes called *dog-tooth spar.*

C. S. is colorless and transparent, except in consequence of impurities which may be present in it; and when perfectly transparent, it exhibits in a high degree the property of double refraction of light, which was first discovered in it by Bartholinus. The presence of foreign substances frequently renders C. S. gray, blue, green, yellow, red, brown, or even black.

The name *Iceland spar* has often been given to C. S., at least to the finest colorless and transparent variety, because it is found in Iceland, massive in trap-rock. *Slate spar* is a lamellar variety, often with a shining, pearly luster, and a greasy feel, of which Wicklow in Ireland, and Glen Tilt in Scotland are localities.

CALCA'REOUS SPRINGS, springs charged with calcareous matter which is deposited in the form of incrustations. Such deposit is called calcareous tufa, and takes the form of other substances inclosed, such as leaves, twigs, and branches of trees. When freshly quarried it is easily shaped, and is therefore convenient for building. The temples of Paestum are of this material, and the stone has acquired great solidity and strength. In central New York such deposits are common, forming the marl below swamps and in the bottoms of ponds. One of these springs at Clermont, France, has formed a deposit of white concretionary limestone 240 ft. long, 16 high, and 12 wide.

CALCAREOUS TUFA, Calc-tuff, or Tufaceous Limestone, a mineral which in its chemical composition is nearly identical with limestone and marble; but is distinguished by its spongy and cellular structure. It is generally rather soft, brittle, and friable, but sometimes it is sufficiently hard to be used as a building-stone. The *travertino*, used for building at Rome, is a hard calcareous tufa. The color of C. T. is generally yellowish-gray, sometimes yellow or yellowish-brown. It occurs massive, or assumes many uncrystalline forms, as tubular, botryoidal (like clusters of grapes), cellular, etc. Sometimes it incrusts animal and vegetable remains. It is frequent in the neighborhood of calcareous springs. It is sometimes used as a filtering-stone.

CALCAR, or KALCKER, John de, 1499–1546; a painter, disciple of Titian at Venice, and perfected by studying Raphael; so good an imitator of Titian that his works can scarcely be distinguished from those of that master. One of his pieces is a "Nativity" representing angels around the infant Savior, so arranged that the light by which they are seen comes wholly from the child.

CALCASIEU, a parish in s.w. Louisiana, on the gulf of Mexico and Texan border; 5000 sq.m.; pop. '70, 6733—1457 colored; in '80, 12,488. The surface is level in broad savannahs, and the soil very productive in corn, sugar, molasses, and cotton. Chief town, Lake Charles Court-house.

CALCASIEU, a river in Louisiana, about 200 m. long, running into the gulf of Mexico. Near its mouth is a broad expansion called C. lake. The river is not navigable.

CALCED'ONY. See Chalcedony.

CALCEOLA'RIA (Lat. *calceolus*, a little shoe), a genus of plants of the natural order *scrophulariaceæ* (q.v.), of which there are numerous species, natives of South America, chiefly of that part of the Andes which is more than 9600 ft. above the sea, a few of them reaching almost to the utmost limits of vegetation; although some are found in lower and warmer situations, and some in the southern extremity of the American continent. They abound so much in some parts of Chili and Peru, as to give a peculiar aspect to the landscape. The calyx in this genus is 4-partite; the corolla, 2-lipped; the lower lip remarkably inflated, so as to form a bag; and the shape of the whole in some species considerably resembling that of a slipper. There are only two fertile stamens, and the capsule is semi-bivalvular with bifid valves. Some of the species are shrubby, some herbaceous, almost all the herbaceous species being perennial. Many of them have corymbs of numerous showy flowers. Yellow is the color which chiefly prevails in the flowers of the original species, and next to it purple; but the art of the gardener has succeeded in producing varieties and hybrids which exhibit many other rich and delicate tints. Calceolarias have been florists' flowers since about 1830, the curious appearance of the flowers combining with their beauty to render them attractive, and in no genus is the production of hybrids more easily or frequently effected. They are easily propagated by cuttings. Few plants require more liberal supplies of water. They are generally treated in Britain as half-hardy or as greenhouse plants.—Some of the species are used in South America for dyeing. The roots of *C. arachnoidea*, a parent of many of the hybrids in our gardens, are largely employed in Chili, under the name of *relbum*, for dyeing woolen cloths crimson.

CALCHAS, a Greek soothsayer in the time of the Trojan war who foretold the length of the siege, and when the fleet was detained at Aulis by adverse winds, demanded the sacrifice of Iphigenia. He is said to have died from vexation on being surpassed in prophecy by another soothsayer called Mopsus.

CALCINA'TION, or Calcining (see Calx), is the process of heating or roasting in furnaces or in heaps the various metallic ores. It is resorted to as the first stage in the extraction of the majority of the common metals from their ores, and is essentially a process of oxidation.

CALCIUM is the metal present in chalk, stucco, and other compounds of lime. It may be obtained by passing a powerful current of voltaic electricity through fused chloride of C. (CaCl), when the metal separates in minute globules. It is a yellowish-white metal, can be rolled into sheets, and hammered into leaves, and is intermediate between lead and gold in hardness. It is represented by the symbol Ca, has the atomic weight or equivalent 30 (new system, 40), and has the density 1.578, or nearly half as heavy again as water. At ordinary temperatures, it slowly tarnishes by oxidation; and when placed in contact with water, it rapidly decomposes the water (HO), forming lime (CaO), whilst hydrogen escapes. To be retained bright, C. must be kept under the surface of naphtha. At a red heat, it melts and burns with a dazzling white light, accompanied by scintillations. See LIME.

CALCOTT, Sir AUGUSTUS WALL, R.A., a distinguished English landscape painter, was b. at Kensington, London, in 1779. In 1803, he devoted himself to landscape painting; in 1810, he was made a member of the royal academy; was knighted in 1837; and in 1844, made conservator of royal pictures. His landscapes are remarkable for their beauty, clear definition of objects, good drawing, and truthful natural coloring. He has been called the English Claude, a designation to which he is not altogether unentitled. He died Nov., 1844.

CALCOTT, JOHN WALL, a distinguished musical composer, elder brother of the above, was b. at Kensington, 1766. Too nervous to be a surgeon, for which he was intended, he devoted his attention to music, and in 1785 won three of the four gold medals annually given by the Catch club, the admired *O Sovereign of the Willing Soul* being one of the successful pieces. During the next ten years, he obtained twenty of the medals given by the same society. In 1785, he was made bachelor, and five years afterwards, doctor of music at Oxford. In 1805, he published his *Musical Grammar;* in the following year his mind gave way under the continuous strain to which it had been subject. He recovered again, but only for three years, when he relapsed, and continued insane until his death in May, 1821. He was one of the most eminent composers belonging to the British school of music, and especially celebrated for his glee compositions. His choicest productions were published in two volumes by his son-in-law, Mr. Horsley, in 1824.

CALCRAFT, WILLIAM, d. 1879; the official executioner or hangman of London; a person of quiet and even gentle manners, who was looked upon by the ignorant as some fearful being quite out of the natural order of humanity. As public executions were stopped in 1860 his fame declined, and little was heard of him except through the exaggerated reports of the ignorant. The price for hanging is fixed in Britain at 14*s.* 6*d.*, of which 7*s.* 6*d.* is the fee, 4*s.* 6*d.* for stripping the body, and 2*s.* 6*d.* for the use of the shell (coffin). C. received that price regularly; he made much more by traveling expenses, perquisites, etc. He died in financially comfortable circumstances. Bull, (prenomen unknown), the first English hangman whose name survives, lived in the 16th century. The first person hanged in England was Maurice, a nobleman's son. He was executed in 1241, for piracy. Before C., Jack Ketch was the most famous of executioners. He executed, among others, lord William Russell and the duke of Monmouth. C. had retired from office some years before his death on account of advancing age.

CALC'-SINTER, a mineral, chemically identical with the purest marble and calcareous spar, but peculiarly characterized by its fibrous structure. It is formed from water holding carbonate of lime in solution, and occurs generally incrusting the roofs, walls, and floors of caves, particularly those in limestone rocks; often assuming curious and even fantastic forms. Macalister s cave, in the isle of Skye, and the limestone caves of Derbyshire, are the most celebrated British localities. But the stalactitic cave of Antiparos, in the Grecian archipelago, is a far more famous locality for this mineral, which is often called *calcareous alabaster*, and used for the same purposes with the true alabaster (q.v.), to which it is in some respects preferable, particularly as not being liable to injury from exposure to the air. Volterra, in Tuscany, is another very famous locality for calc-sinter.

CALCULATING MACHINE. The most remarkable application hitherto made of machinery, is perhaps that through which it has been used to relieve the scientific inquirer to a very great extent of the fatigue of manipulating figures, which consumes so much of his time and energies. Various machines have been constructed for this purpose, differing in the extent of their faculties—to use words more suitable to thinking beings than to engines—and somewhat in the principles of their construction. By the *arithmometer*, for instance, a machine invented by M. Thomas of Colmar, all ordinary arithmetical operations are executed without fatigue to the operator; and by a machine contrived by M. M. Scheutz, which rests on the principle of *differences* (q.v.), on the turning of a wheel, the successive terms of any series whose law may be confided to it, are produced—the machine at the same time *printing* a large proportion of its results, and thus providing for the accuracy of its tables. It is a fact of which the nation should be proud, that our countryman, Mr. Babbage, is universally acknowledged as the instigating and guiding genius in the progress of these remarkable inventions. Among his inventions was a *difference engine*, of very comprehensive powers, indeed

capable of managing series so complex that the differences of its terms do not reach zero until we ascend to the seventh order (*vide* art. DIFFERENCES, CALCULUS OF). An immense range of nautical and astronomical tables lie within the limits just defined; and the machine further tabulates approximately any series whatever that can be treated by the *method of differences*. While engaged in constructing the *difference machine*, Mr. Babbage, probably through his increased experience of the capabilities of machinery, was led to form a new conception—that, namely, of the *analytical machine*. He actually succeeded so far as to devise the means of making his machine perform all the elementary operations of addition, subtraction, multiplication, and division; and it is clear that all changes that can be produced on quantity are merely combinations of these. If, then, he could but have made his machine perform these operations at command, and according to any special order, it could have clearly developed any function whatever whose law is ascertained and fixed. A solution of this difficulty was suggested by the Jacquard loom (q.v.), in which the *cards* oblige a machine capable of working *any* pattern to work out one particular pattern; and Mr. Babbage having succeeded so far as to form a machine capable of executing any development, expected, by means of *cards of operations*, to compel his C. M. to work according to one fixed law, and no other. Government, however, did not see its way to make the further grants required for this machine, and at Mr. Babbage's death in 1871, nothing further had been done towards its completion. The *difference machine* is now lying, an unfinished curiosity, in the museum of King's college, London. Both machines will be found described in the third volume of Taylor's *Scientific Memoirs*. The *difference engine*, constructed by Grant for the university of Pennsylvania, is said to be less expensive than Babbage's, and less complicated than Scheutz's, though provided like it with an apparatus for printing the results.

CALCULUS, or STONE (in medicine), a hard concretion formed within the animal body, in consequence of the deposition in the solid form of matters which usually remain in solution. See CONCRETION. The concretions most commonly termed calculi are those formed in the kidneys or bladder (*urinary C.*); and those formed in the gall-bladder or biliary ducts (*biliary C.*). Both of these give rise to very painful symptoms, and may even threaten life.

Biliary C., or *gall-stone*, may generally be presumed to exist when excessively severe pain suddenly arises in the right side beneath the border of the ribs, and when in a few hours jaundice comes on, showing that some obstruction has existed to the outward flow of the bile. But the absolute proof that these symptoms depend on C. is often wanting. The pain is fortunately transitory, but is more severe while it lasts than almost any other known form of suffering, unless it be that of a C. in the kidney and ureter. It may be relieved by large doses of opium, but the remedy requires to be cautiously given, as even in medical hands fatal accidents have occurred. Gall-stones, when impacted in the ducts, sometimes have proved fatal; but much more frequently they find their way, sooner or later, into the intestines. They are almost invariably composed of cholesterine (q.v.), with coloring matter and mucus, arranged in layers in a semi-crystalline disposition.

Urinary C. is a disease of all ages, but most common in advanced life and in the male sex. It is also very frequent in gouty persons, or among those who pursue sedentary occupations and live freely. It is rare among those who live much in the open air, or who take much violent exercise, and use little animal food and wine. Among sailors, it is peculiarly rare. In certain parts of the country, the disease is said to be frequent, as in Norfolk, and perhaps along the e. coast of Scotland. In India, too, where some of the predisposing circumstances mentioned above can hardly be said to prevail, stone is by no means uncommon. It would appear, therefore, that the predisposing causes of C. are still very imperfectly understood. In its early stages, the disease usually presents itself in the form of *gravel*, shown by the passage of numerous very small portions of gritty concretions, which may be observed in the urine as a deposit like sand, or like small grains of Cayenne pepper. When such deposits occur frequently, especially if they are present at the time of passing the urine, and not merely after it has cooled, there is reason to apprehend the formation of calculus. If, in these circumstances, there are pains of a dull character in the loins, with occasional twinges of sharper suffering, no time should be lost in seeking medical advice. If a fit of very severe pain should occur in a person for some time affected with gravel, if the urine be bloody, if agonizing twinges, commencing in the loins, sting downwards into the thigh or the groin, it is probable that a stone has already formed in the kidney, and is being displaced towards the bladder. C. in the bladder is at first attended with little suffering, as compared with that caused by the stone in its passage downwards from the kidney; but unless removed or evacuated, the C. is sure to enlarge, and it then becomes the cause of one of the most painful diseases that afflict humanity. The existence of a stone in the bladder, however, should never be taken for granted without a surgical examination, as all the symptoms are deceptive in certain cases. The most striking, and perhaps the most trustworthy evidence of stone in the bladder, apart from the use of the sound (see LITHOTOMY), is smarting and burning pain experienced after the bladder has been emptied, together with occasional temporary stoppage in the flow of urine.

The correct appreciation of all the symptoms, however, demands considerable familiarity with such cases.

The discovery of the tendency to urinary C. at an early period of its growth, has been greatly aided by the use of the microscope and of chemical tests. Generally speaking, it may be said that whenever the urine, after standing for a few hours, can be observed to contain more sediment than a very slight cloudiness towards the bottom of the vessel, there is room for careful inquiry into the existence of some derangement of the health. But all sediments are not equally apt to determine C., nor is the treatment of the different kinds of sediment at all similar; care should therefore be taken to determine, from time to time, whether the character of the sediment may have undergone a change, so that the treatment may be adapted accordingly.

The chief varieties of urinary C. are—1. Uric acid (red sand); 2. Urates of ammonia, soda, lime, etc. (brick-dust sediment); 3. Phosphates of ammonia and magnesia, lime, etc.; 4. Oxalate of lime; 5. Carbonate of lime (chiefly in domestic animals); 6. Cystine; 7. Xanthie oxide (a very rare form, discovered by Dr. Marcet). Calculi are frequently found to be composed of numerous successive layers, having a perfectly distinct chemical composition. Urates and phosphates in particular frequently succeed each other, and form what is called an alternating calculus.

When C. has once fairly formed in the urinary passages, it seems probable that no absolute cure exists except the removal of it, if possible, from the body (see Lithotomy and Lithotrity); but in the stage of gravel, and still more in the earlier stages detected by careful examination of the urine, much may be done to check the tendency to this distressing and dangerous malady. The chief remedies consist in careful regulation of the diet and mode of living, together with the use of solvents adapted to the particular form of deposit found to be habitually present. See Urine.

CALCULUS, The Infinitesimal, otherwise sometimes called the transcendental analysis, is a branch of mathematical science which commands, by one general method, the most difficult problems in geometry and physics. The merit of the invention of this powerful mathematical instrument has been claimed for Leibnitz, but is undoubtedly due with equal justice to Newton, who laid the foundations for it in that celebrated section of his *Principia*, in which he demonstrates the chief theorems regarding the ultimate values or limits of the ratios of variable quantities. The view of one class of writers is, that these distinguished men invented the C. simultaneously and independently; and it is the fact that Leibnitz's system is unfolded from premises differing somewhat from those of Newton. See Fluxions. Another class of writers hold that Newton is the real inventor, and that to Leibnitz no more can be conceded than that he was the first who, using the suggestions of Newton's genius, gave a systematic statement to the principle of the transcendental analysis, and invented its appropriate symbolic language. He had the doctrine of limits before him when he wrote, and did little more than unfold more fully the logic of the processes therein suggested, and exhibit them in algebraical forms.

The infinitesimal C., both in its pure and applied forms, whether of geometry or mechanics, is a branch of the science of number; its symbols are of the same kind, are operated on according to the same laws, and lead to analogous results. It differs from the other branches of the science of number, such as arithmetic and algebra, in regarding number as continuous—i.e., as being capable of gradual growth and of infinitesimal increase, whereas they deal with finite and discontinuous numbers. It differs from ordinary algebra in another respect. In the latter, the values of unknown quantities, and their relations with each other, are detected by aid of equations established between these quantities *directly;* in the C., on the other hand, the equations between the quantities are not directly established, but are obtained by means of other equations primarily established, not between them, but certain derivatives from them, or elements of them. This artifice is most fertile, for it can be shown that in the great majority of cases the relations of quantities concerned in any problem may more easily be inferred from equations between these their derivatives or elements than between themselves.

It will be seen that the C. created a new notion of number—as continuous or growing. It is now necessary, in order to a proper conception of it, that a precise idea should be formed of a *differential.* The simplest idea of a differential is unquestionably that got by considering number as made up of infinitesimal elements, and a differential or "infinitesimal" as being the value of the difference between a number at one stage of its growth and as another *very* near it. Every finite number being—in the view of the C. as first conceived by Leibnitz—composed of an infinite number of these infinitesimal elements, certain axioms at once present themselves regarding infinitesimals; as, for instance, "that a finite number of them has no value at all when added to a finite quantity." Many other such axioms readily follow, from which, on this view, the whole theory of the infinitesimal C. may be constructed. But there are logical objections to this mode of forming the theory of the transcendental analysis, and of three views that have been propounded, that now universally accepted as the most logical, and as being capable of the easiest application, is that founded on the method of limits, already referred to as the invention of Newton. The meaning of a differential on this view will now be explained.

It is clear that the C. can be applied only where numbers may have the continuous character—i.e., where they are or may be conceived as being variable. If two unknown quantities are connected by a single equation only, we clearly have the condition satisfied, as where y and x are connected by the equation

$$(1) \quad y = F(x),$$

where F is a sign denoting some *function* of x, as tan. x, cos. x, x^2, etc. This equality may be satisfied by innumerable values of y and x. One question which the C. solves is, how does y vary when x varies? To solve it, and, at the same time, show how the doctrine of limits affects the definition of a differential, suppose x, y, and $x+Dx$, $y+Dy$, to be two pairs of values of the variables which satisfy the above equation; then

$$(2) \quad y = F(x), \quad \text{and (3)} \quad y+Dy = F(x+Dx).$$

From (2) and (3) we have, by subtraction,

$$(4) \quad Dy = F(x+Dx) - F(x);$$

whence we have the ratio

$$\frac{Dy}{Dx} = \frac{F(x+Dx)-Fx)}{Dx}.$$

This ratio will generally change in value as Dx and Dy diminish, till, as they both vanish, which they must do simultaneously, it assumes the form $\frac{0}{0}$. Taking this form, it ceases to have a determinate actual value, and it is necessary to resort to the method of limits, to ascertain the value to which it was approaching, as Dx and Dy approached zero. Let, then, dx and dy be any quantities whose ratio is equal to the limiting ratio of the increments Dx, Dy, so that

$$\frac{dy}{dx} = \text{limit } \frac{Dx}{Dy}$$

as Dx and Dy approach zero. Then dx and dy are the differentials of x and y. It may be observed that where x and y are connected as above, they cannot vary independently of one another. In the case assumed, x has been taken as what is called the *independent* variable, the question being, how does y vary when x varies. If y were made the independent variable, it would be necessary to solve the equation $y = F(x)$, if possible, so as to express x in terms of y. The result would be an equation $x = \varphi(y)$. This being obtained, we should find $\frac{dx}{dy} = \text{limit } \frac{Dx}{Dy}$ as before. It will be seen that on this view differentials are defined merely by their ratio to one another. Their actual magnitude is perfectly arbitrary. This, however, does not render an equation involving differentials indeterminate, since their relative magnitude is definite, and since, from the nature of the definition, a differential cannot appear on one side of an equation without another connected with it appearing on the other.

The idea of a differential being once comprehended, the reader will be able to understand, in a general way, the main divisions of the C., which we shall now briefly delineate. So much is clear from what has been stated, that there must be two main divisions —one by which, the primary quantities being known, we may determine their differentials; and another by which, knowing the differentials, we may detect the primary quantities. These divisions constitute the differential C. and integral C. respectively.

1. The Differential Calculus.—Recurring to the formula already given we know

$$\frac{dy}{dx} = \text{limit } \frac{Dy}{Dx} = \text{limit } \frac{F(x+Dx) - F(x)}{Dx}.$$

It is clear that, in the general case, $\frac{F(x+Dx) - F(x)}{Dx}$ at the limit will still be some function of x. Calling it $F'(x)$, we have generally $\frac{dy}{dx} = F'(x)$. $F'(x)$ is called the first differential coefficient of y or $F(x)$. Being a function of x, it may be again differentiated. The result is written

$$\frac{d^2y}{dx^2} = F''(x),$$

$F''(x)$ being the second differential coefficient of y or $F(x)$; and again $F''(x)$ may be a function of x, and so capable of differentiation. Now it is the object of the differential C. to show how to obtain the various differentials of those few simple functions of quantity which are recognized in analysis, whether they are presented singly or in any form of combination. Such functions are the sum, difference, product, and quotient of variables, and their powers and roots; exponentials, logarithms; and direct and inverse circular functions. The C. so far is complete as we can differentiate any of those functions or any combination of them—whether the functions be explicit or implicit; and with equal ease we may differentiate them a second or any number of times. This C.

is capable of many interesting applications as to problems of maxima and minima, the tracing of curves, etc., which cannot here be particularly noticed.

2. The Integral Calculus deals with the inverse of the former problem. The former was: Given $F(x)$, to find $F'(x)$, $F''(x)$, and so on. The present is in the simplest case—viz., that of an explicit function· Given $\frac{dy}{dx} = F'(x)$, to find $F(x)$. The methods of the integral C., instead of being general, are little better than artifices suited to particular cases; no popular view can be given of these. In many cases, integration is quite impossible. The explanation of *integration by parts*, by *approximation*, *definite integrals*, and *singular solutions*, is far beyond the scope of the present work. The reader is referred to any of the numerous text-books on the subject. The integral C. has applications in almost every branch of mathematical and physical science. It is specially of use in determining the lengths of curved lines, the areas of curved surfaces, and the solid contents of regular solids of whatever form. The whole of the lunar and planetary theories may be described as an application of the integral C., especially of that branch of it which deals with the integration of differential equations It is applied, too, in hydrostatics and hydrodynamics, and in the sciences of light, sound, and heat. In short, it is an instrument without which most of the leading triumphs in physical science could never have been achieved.

Calculus of Variations.—The foundation of this C. is a method of differentiation, but of quite a peculiar kind. As above explained, the object of the differential C. is to determine the form which a function, such as $F(x)$, will assume if x receive an indefinitely small increment, such as Dx. In the C. of variations, the object is to ascertain and lay down the laws of the changes supervening on a slight alteration of the *form of the function*, or should $F(x)$ become F^1x. This C. commands with ease a class of problems called problems of isoperimeters, which were formerly insoluble. It has also power over mechanical problems, and many departments of high physics cannot be touched without its aid Mr. Airy and prof. Jellet have both written works on the subject, which may be consulted.

Calculus of Finite Differences, Calculus of Functions.—For brief notices of these growths from the original transcendental analysis, see the articles under the headings Difference and Functions.

CALCUTTA (*Kali Ghatta*, the ghaut or landing-place of the goddess Kali), the capital of the province of Bengal, and metropolis of British India, is situated on the left bank of the river Hoogly, an arm of the Ganges, in 22° 35′ n. lat., and 88° 27′ e. long., about 100 m from the sea by the river. C. was founded by governor Charnock in the year 1686, by the removal hither of the factories of the East India company. In 1700, three villages surrounding the factories having been conferred upon the company by the emperor of Delhi, in recognition of a present made to Azim, a son of Aurungzebe, they were forthwith fortified, and received the name of fort William, in honor of the reigning king; but the place was subsequently termed Calcutta, the name of one of the villages. In 1707, C. had acquired some importance as a town, and was made the seat of a presidency. In 1756, however, a great misfortune befell the rising town; it was unexpectedly attacked by Surajah Dowlah, the nawaub of Bengal, and being abandoned by a number of those whose duty it was to defend the place, it was compelled to yield after undergoing a two days' siege. Only 146 men, however, fell into the enemy's hands; but these were treated with heartless cruelty. Cast at night into a confined cell, about 20 ft. square—the notorious "Black Hole" (q.v.)—they endured the most unheard-of sufferings, and in the morning it was found that only 23 out of 146 had survived the horrors of that night. The city remained in the hands of the enemy until eight months afterwards, when Clive arrived in the country from England. In conjunction with admiral Watson, Clive succeeded in recapturing the town, and afterwards concluded a peace with the nawaub. Soon after this, and subsequent to the important victory of Plassey, the possessions of the East India company were greatly extended by means of grants made by the emperor of Delhi, and C. once more resumed its career of progress, and advanced rapidly in prosperity. In 1852, C. was erected into a municipality, the proprietors paying assessments, and erecting commissioners to apply the proceeds of these assessments in cleansing, improving, and embellishing the town. In 1837, the population of the town proper amounted to 229,700; in 1872, it had increased to 447,601, or with Howrah and suburbs, 892,429 (1881, without Howrah, 683,458). Besides these, thousands of the three and a half millions who sleep at night in the surrounding districts of Hoogly and the 24 pergunnahs, flock during the day to C., on foot, by boat, or by railway, to their daily toil. The inhabitants are mostly Hindus; but there is also a good proportion of Mohammedans. About 20,000 are Europeans; 20,000 Eurasians, or the progeny of white fathers with native mothers; and there is a considerable number of Armenians, Greeks, Jews, Parsees, and negroes. The city extends for about 5 m. along the river, and is somewhat less than 2 m. in breadth at its broadest part, the area being about 8 sq. m., and comprised for the most part between the river and the circular road, a spacious roadway which marks the landward boundary of the city proper. Beyond this road there lie extensive suburbs, the chief of which are Chitpore on the n., Nunden Baugh, Bahar-Simleah, Sealdah, Entally, and Ballygunge on the e., and Bhowaneepore, Allipore, and Kidderpore

on the south The villages of Sulkeah, Howra, and Seebpoor are situated on the opposite side of the river, and contain the salt-golahs or warehouses of the government, extensive manufactories, dockyards, and ship-building establishments. The appearance of the city as it is approached by the river is very striking; on the left are the botanical gardens, destroyed by the cyclones of 1867 and 1870, but since replanted, and the bishop's college, a handsome Gothic edifice, erected by the society for the propagation of the gospel in foreign parts; on the right is the suburb of Garden Reach, with its handsome country-seats and beautiful gardens; further on are the government dockyards and the arsenal; beyond these is the Maidan esplanade, which has been termed the Hyde park of India, being the favorite place of resort of the *élite* of C. for their evening drive. Here, near the river, lies fort William, the largest fortress in India, having been constructed at a cost of £2,000,000, and occupying, with the outworks, an area of about half a mile in diameter. It is garrisoned by European and native soldiers, mounts 619 guns, and its armory contains 80,000 stands of small-arms. Facing the esplanade, among other fine buildings, is the government house, a magnificent palace erected by the marquis of Wellesley. Beyond this, extending northwards along the river bank, is the Strand, 2 m. in length, and 40 ft. above low water, with various ghauts or landing-places. It is adorned by many fine buildings, including the custom-house, the new mint, and other government offices, and the appearance given by these and other edifices has gained for C. the appellation of "city of palaces." Among its other places of interest, mention may be made of the Sudder Dewanee Adawlut, the principal court of justice; the town-hall, a fine building; the Bengal club, writers' buildings, bank of Bengal, Jesuits' college, medical college, university, theater, besides various churches, mosques, Hindu temples, and pagodas and numerous bazaars. There are a number of monuments throughout the city, the most noticeable being those erected to the marquis of Wellesley and sir David Ochterlony. Although the European quarter of the town is distinguished for its fine public buildings and commodious dwelling-houses, the quarters occupied by the natives present a very different appearance, their houses being in most instances built of mud or bamboo and mats, and the streets narrow and unpaved. Considerable improvements have, however, been effected of late; new and wider streets have been opened through crowded quarters; brick houses are fast replacing the huts, and an extensive system of drainage has been carried out, to the no small advantage of the inhabitants, The cyclone of Nov., 1867, destroyed 30,000 native houses, and that of June, 1870, was likewise very destructive.

The water supply of C. has recently been very much improved. Formerly, the water was kept in large tanks, interspersed throughout the city, whence it was borne by water-carriers or *bahisties* in large leather bags. But within the past five years, a supply of excellent water has been obtained from the Hoogly, about 15 m. above C., where it is filtered and sent down by pipes in the usual way. The result of this has been a marked improvement in the health of the city. Gas has now taken the place of the oil-lamps which were formerly in general use for lighting the streets at night. Tramways have been recently tried in some of the principal streets, but as yet with little success. A canal girds a part of the city beyond the circular road

The communications of C. afford great facilities for its extensive commerce. There are several lines of railway to various parts of India; the East Indian to Benares, Delhi, and Multan, its present terminus, whence it is to be continued to Kurrachee; the Eastern Bengal, the extension of which to Gulundu was opened in 1871; and the Calcutta and South-eastern to the mouth of the Ganges. The great Indian Peninsula railway branches off from the East Indian, and connects C. with Bombay and Madras. C. is also connected by electric telegraph with the principal towns of India, and can communicate with England by three different lines. Uninterrupted communication is kept up with Great Britain by numerous and well-appointed steamers and sailing-vessels. This intercourse has been greatly facilitated by the opening of the Suez canal. Navigation on the Hooghly is dangerous, owing to the shifting sands; and though much has been attempted, little has been effected in the way of remedying the evil. The river, adjacent to the city, varies in breadth from a quarter of a mile to nearly a mile. Ships of 2000 tons can ascend to Calcutta.

The growth of scientific and literary societies, here and elsewhere in India among the native communities, indicates a degree of progress and intellectual activity very hopeful for the future of India. The principal of these in C. are the Bengal Asiatic society, founded in 1784 by sir W. Jones, possessing a fine library, and a valuable and extensive museum; the Bethune society, for the promotion of intercourse between European and native gentlemen; the Dalhousie institute, for the literary and social improvement of all classes of the community; the Bengal social science association, and others. The university of C. was founded in 1857, on the same basis as the London university, and exercises functions over Bengal, the North-west Provinces, Oude, and the Central Provinces. Colleges have been instituted to prepare intending students. In 1877, of 2425 candidates for admission to the university of C., 1355 passed the required examinations. Other educational institutions are numerous in Calcutta. The principal places for religious instruction are Bishop's college, intended chiefly for the education of missionaries and teachers, and the institutions of the established and free churches of Scotland for the same purpose, all which are ably conducted.

C. may be regarded as the great commercial center of Asia. One third of the whole

trade of India is done here. In 1877, the exports amounted to £26,596,018, exclusive of treasure, and the imports to £16,693,813. The chief exports are jute, cotton, rice, sugar, indigo, coffee, tea, saltpeter, linseed, shellac, buffalo horns, hides, castor-oil, cutch, gunny bags, etc. The jute exported in 1872 was valued at £4,000,000, the indigo at £2,500,000, and the tea at £1,400,000. In the same year 658 sailing-vessels and 301 steamers, with a total tonnage of 999,614, arrived in the Hooghly; and 637 sailing-vessels and 301 steamers, with a total tonnage of 957,523, sailed. The principal industries are sugar refining, cotton manufacturing, flour, saw, and oil mills, and ship-building docks. Several newspapers are published. There are a few banks and numerous insurance and other companies, with a chamber of commerce. Living is comparatively cheap, and most of the luxuries of life, as well as its necessaries, are to be had in the unpretentious shops of C. as readily as in most European towns. The annual fall of rain averages 64 in.; the temperature in the shade ranges in July from 78° to 87°, and in Dec. from 60° to 79°.

C. is the headquarters of the governor-general of India, and the seat of the government, the supreme courts of justice, and of the court of appeal for the province of Bengal.

CALDA'NI, Leopoldo Marco Antonio, 1725–1813; an anatomist and physician, b. at Bologna, assistant to Morgagni, the celebrated anatomist of Padua, after whose death C. was chosen his successor in the professorship. At the age of 76 he published a valuable series of anatomical plates. He had long before published *Elements of Pathology and Physiology.*

CALDAS, or Caldetas (Lat. *callidus,* hot), the Spanish for warm springs (*aquas,* waters, being understood), which are very abundant in the Peninsula, where a great number of places have received their names from the presence of these mineral waters; such as C. de Malavella, C. de Estrac, and C. de Mombuy, in Catalonia; C. de Reyes, C. de Cuntis, and C. de Tuy, in Galicia; C. de Taïpas, C. de Faveios, C. de Rainhas, and C. de Renduse, in Portugal. The name has also passed into the topography of the new world. There is a C. in Brazil, which is noted for its hot sulphur springs.

CALDECOTT, Randolph. See page 886.

CALDER, a river in the West Riding of Yorkshire. It rises in a marsh on the borders of Lancashire, near Burnley, runs tortuously e. in the deep valley of Todmorden, past Halifax, Dewsbury, and Wakefield. It then runs n.e., and after a total course of 40 m., it joins the Aire near Pontefract, that river falling into the Ouse. The C. is important as forming a considerable portion of the canal route through Yorkshire and Lancashire, between the e. and w. coasts of England.

CALDER, Sir Robert, 1745–1815; a Scotch baron of an ancient family, second son of sir Thomas Calder of Muirton. He served long and honorably in the British navy, and as captain of the fleet took part in the battle off cape St. Vincent in 1797, for which he received a baronetcy and the thanks of parliament. He was a rear-admiral in active service during the expected invasion of England by Napoleon, received both praise and blame, and was tried by court-martial. He was acquitted of disaffection and cowardice, but reprimanded for not having done more to renew an indecisive engagement. Three years before he died he was restored to command.

CALDERON (Don Pedro) De la Barca Henao y Riano, was b. in Madrid, in the year 1601, and received his early education in the Jesuits' college at Madrid. Afterwards, at Salamanca, he studied chiefly history, philosophy, and law. His poetical genius was precocious. Before he was 14 years old, he had written a drama, *El Carro del Cielo* (The Celestial Chariot). In early life he gained, by his poetry, and also by his fertile invention of decorations, etc., for festive occasions, the patronage of several distinguished persons, and, on leaving Salamanca, 1619, was well received by the courtiers at Madrid. Love of military adventure induced him to enter the army, 1625; and, after serving with distinction in Milan and the Netherlands, he was recalled to the court of Philip IV., a prince fond of theatrical amusements, by whom he was employed to superintend various court amusements, and especially to invent dramas for the royal theater. In the following year C. was made knight of the order of San Jago, and took part in the campaign in Catalonia. Peace brought him back to poetry. The king gave him a pension, contrived to let him cultivate uninterruptedly his fertile dramatic genius, and spared no cost in securing for his plays a splendid initiation on the stage. In 1651, C. received from the head of the order of San Jago permission to enter the church, and, in 1653, was appointed to the chaplaincy of the archepiscopal church of Toledo; but, as this post removed him too far from the court, he was appointed chaplain in the royal chapel at Madrid, 1663, and received, with other favors, a pension charged on the revenue of Sicily. In the same year he was appointed a priest in the brotherhood of San Pedro, and shortly before his death, was elected by his brethren as their *caplan mayor.* He died May 25, 1681, leaving his considerable property to the fraternity of San Pedro, by whom a splendid monument to his memory was raised in the church of San Salvador at Madrid. Fame and pecuniary prosperity had accompanied his career. The chief cities of Spain—such as Toledo, Seville, and Granada—had paid him, from time to time, large sums of money for writing their *Autos Sacramentales,* or *Corpus Christi* pieces. In these compositions, C. excelled all his predecessors, and esteemed them more highly

than all his other works, though in many respects the latter display the author's genius quite as remarkably.

Spain numbers C. among its greatest poets, and criticism must allow that many of the defects in his works are to be ascribed to circumstances, and the times in which he lived, rather than to the native tendencies of his genius. He is characterized by brilliancy of fancy, elegance of versification, and a richness of detail, which from its very abundance often becomes tedious. His collected dramatic works—including many pieces of intrigue, heroic comedies, and historical plays, of which some deserve the title of tragedy—amount to 128. Among his romantic tragedies, the *Constant Prince* (*El Principe Constante*) holds the first rank. Besides these, he wrote 95 *Autos Sacramentales;* 200 *Loas* (preludes); and 100 *Saynetes* (divertissements). His last play, *Hado y Divisa*, was written in his 80th year. His shorter poems have perished; but his dramas have held their place on the stage better than those of Lope de Vega himself. The most complete edition of his dramas appeared at Madrid (9 vols., 1683–89); another was published by Apuntes (10 vols., Madrid, 1760–63). Goethe and Schlegel have made him popular in Germany, but in Britain he is not well known, and in France not cared for.

CALDERON, Don Serafin Estebanez, a Spanish poet, was b. at Malaga about the commencement of the century, studied law at the university of Granada, and in 1822 became professor of poetry and rhetoric there. A volume of poems which he published shortly after procured for him some distinction. Subsequently, he became an advocate in his native city, but still continued faithful to the muses. In 1830, he went to Madrid, where he published anonymously his *Poesías del Solitario* (1833). He also wrote several articles on Andalusian manners for the *Cartas Españolas*, the only literary journal at that period in Spain. In 1836, he was appointed civil governor of Logroño, but an accident obliged him to return to Madrid, where he devoted himself to collecting MSS. of the old national literature, to be the basis of a great critical edition of the *Cancioneros* and *Romanceros.* C. wrote likewise a fine novel, *Cristianos y Moriscos.* To the literature of the Spanish Moors he paid great attention. His *Escenas Andaluces* (1847) are a series of lively sketches of Andalusian life. At his death in Feb., 1867, he left behind him a work on the *Expediciones y Aventuras de los Españoles en Africa.* The Spanish government purchased his very valuable library.

CALDERON, P. H. See page 886.

CALDERWOOD, David, an eminent Scottish divine and ecclesiastical historian, descended of a good family, was b. in 1575, and about 1604 was settled as Presbyterian minister of Crailing, Roxburghshire. Opposed to the designs of James VI. for the establishment of Episcopacy in Scotland, on that monarch's visit to his native country in 1617, he and other ministers signed a protest against a bill, then before the Scots parliament, for granting the power of framing new laws for the church to an ecclesiastical council appointed by the king, and in consequence he was summoned before the high commission of St. Andrews. Refusing to submit, he was committed to prison for contumacy, and then banished the kingdom. He retired to Holland, and in 1623 published there his celebrated controversial work, entitled *Altare Damascenum*, etc., in which he rigorously examined the origin and authority of Episcopacy. In 1622, a pretended recantation of his protest was published at London by a venal writer, Patrick Scott. While on the continent, C. was known by the quaint appellation of Edwardus Didoclavius, being an anagram on his name Latinized. After king James's death in 1625, he returned to Scotland, and for some years was engaged collecting all the memorials relating to the ecclesiastical affairs of Scotland, from the beginning of the reformation there to the death of James VI. In 1638, he became minister of Pencaitland, near Edinburgh; and in 1643 was appointed one of the committee for drawing up the *Directory for Public Worship in Scotland.* He died at Jedburgh in 1651. From the original MS. of his *History of the Kirk of Scotland*, preserved in the British museum, an edition was printed for the Wodrow society, in 8 vols., 8vo (Edin. 1842–45), edited by the Rev. Thomas Thomson.

CALDIE'RO (ancient *Caldarium*), a decayed town of n. Italy, about nine m. e. of Verona. Its thermal springs were in repute as early as the 1st c. of the Christian era, and continued to enjoy popularity until the commencement of the 16th c., after which they gradually became neglected, and are now little visited. The Austrians repulsed the French here in 1796.

CALDWELL, a co. in w. Kentucky; 250 sq.m.; pop. 80, 11,280—2186 colored; generally level, and good pasture land. Iron and coal are found. Chief productions, corn, tobacco, wool, etc. The Elizabethtown and Paducah railroad is projected through this county. Co. seat, Princeton.

CALDWELL, a parish in Louisiana, on the Washita river; 528 sq.m.; pop. '80, 5770—2897 colored. Surface hilly, producing corn, cotton, etc. Chief town, Columbia.

CALDWELL, a co. in n.w. Missouri, on the Hannibal and St. Joseph railroad; 435 sq.m.; pop. '70, 11,390—284 colored; in '80, 13,654. Products, corn, wheat, oats, butter, wool, etc. Surface level, and soil rich. Co. seat, Kingston.

CALDWELL, a co. in n.w. North Carolina, on Catawba river and the Western North Carolina railroad; 450 sq.m.; pop. '80, 10,288—1600 colored. Surface rough and

partly mountainous, including a portion of the Blue Ridge. Productions, corn, wheat, oats, and tobacco. Co. seat, Lenoir.

CALDWELL, a co. in s.e. Texas, e. of the San Marcos river; 535 sq.m.; pop. '70, 6572—2531 colored; in '80, 11,757. Main business agriculture and stock-raising; an undulating surface, well wooded and fertile. Co. seat Lockhart, near which are about 20 springs of some celebrity.

CALDWELL, a village and seat of justice of Warren co., N. Y., in a delightful situation at the s. end of lake George—a place much frequented by tourists. Near by are the ruins of fort St. George of the French and Indian and revolutionary wars, and on the site of fort William Henry is an immense hotel. Pop. of township, '80, 1223.

CALDWELL, Charles, 1772–1853; a native of N. C., celebrated as a physician, and writer on medical subjects. He published Blumenbach's *Elements of Physiology* translated from the Latin, edited the *Port Folio*, edited Cullen's *Practice of Physic*, published the *Life and Campaigns of General Greene;* was professor of medicine in Transylvania university; made a tour in Europe; established medical institutions in Louisville; wrote *Memoirs of the Rev. Dr. Horace Holley*, and left his own memoirs ready for publication after his death.

CALDWELL, Charles H. B. See page 886.

CALDWELL, James, 1734–81; a native of Va.; graduated at the college of New Jersey; became pastor of the Presbyterian church in Elizabethtown. He was a zealous patriot during the revolution, and became obnoxious to the tories of the region, who, in 1780, burned his house and church. Soon afterwards a British force from Staten Island fell upon the village of Connecticut Farms, where C.'s wife and children were temporarily resident, and the wife was killed by a shot while praying with her children. It is of C. that the story is told of his distributing hymn books to the soldiers short of wadding, with the exhortation "Now, boys, put Watts into them." C. was shot and killed by a patriot sentinel at Elizabethtown Point during a dispute about a package that the soldier declared it his duty to examine. The soldier was tried by the civil authorities for murder, convicted, and executed. A fine monument to "The Soldier Parson" was dedicated at Elizabethtown on the 64th anniversary of his death.

CALDWELL, Joseph, d.d., 1773–1835; a native of N. C.; graduated at the college of New Jersey, and a tutor there from 1791–96; then chosen professor of mathematics in the North Carolina university, and in 1804 was made president and professor of moral philosophy. He wrote a *Treatise on Geometry* and letters on internal improvements.

CALDWELL, Samuel Lunt, d.d. See page 886.

CALEDO'NIA, a kind of poetical name applied to Scotland, being a resumption of that given by the Romans to the country n. of the wall of Antoninus, which ran between the firths of Forth and Clyde. Among the chief tribes of this region were the Caledonii, whence the whole country has been called Caledonia. Tacitus speaks of the Caledonians as having red hair, large limbs; being naked and barefooted; living in tents, without cities; supporting themselves by pasturing cattle, by the chase, and by certain ferries; addicted to predatory warfare; and fighting in chariots with shields, short spears, and daggers. They are supposed to have been of Gaelic or Celtic origin, and to have painted their bodies, whence the name Picti or Picts, by which, according to many writers, they were afterwards known. Agricola was the first Roman gen. to come in contact with the Caledonians. In 84 a.d. he defeated them, now united to repel a common enemy, under their chief Galgacus, at the Mons Grampius (or Graupius), the site of which has not been determined. The Romans overran the n.e. of Scotland as far as the Moray firth, and formed many encampments (of which remains still exist), but they never reduced the country to a Roman province. Roman coins and military relics have been found in connection with these camps. The name of Caledonii disappears about the beginning of the 4th c., when the inhabitants of Scotland begin to be spoken of as Scots (q.v.) and Picts (q.v.).

CALEDONIA, a co. in n.e. Vermont, on the New Hampshire border, intersected by the Connecticut and Passumpsic River railroad; 650 sq.m.; pop. '80, 23,607. It is an agricultural region, with streams that furnish abundant water-power, and has quarries of granite and limestone, and sulphur springs. Co. seat, St. Johnsbury.

CALEDONIAN CANAL, a chain of natural lakes united by artificial canals, running across the n. of Scotland in a straight line from n.e. to s.w., from the North sea to the Atlantic, through Glenmore, or the Great Glen of Albin, in Inverness-shire, and touching Argyleshire at the s. end. The sea and fresh water lochs in this line are Beauly, Ness, Oich, Lochy, Eil, and Linnhe. The canal was formed to avoid the dangerous and tedious navigation of ships, especially coasting vessels, round by the Pentland firth, cape Wrath, and the Hebrides; the distance between Kinnaird's head and the sound of Mull by this route being 500 m., but by the canal only 250, with an average saving of 9½ days for sailing vessels. The C. C. begins in the Beauly firth, near Inverness, whence a cut of 7 m. joins loch Ness, which is 24 by 1¼ mile. A cut of 6 m. joins loch Ness and loch Oich, which is 3½ by ½ mile. Another cut of 2 m. joins loch Oich and loch Lochy, which is 10 by 1 m.; and a fourth cut of 8 m. joins loch Eil at the village of Corpach, 2 m. n. of fort William. This ship-communication is 60¼ m. long,

37½ m. being through natural lochs or lakes, and 23 m. by artificial cuts. Each cut is 120 ft. broad at surface, and 50 at bottom, and 17 deep. The highest part is loch Oich, which is 94 ft. above the sea. There are in all 28 lochs, each 170 to 180 ft. long, and 40 wide, with a rise or lift of water of 8 feet. Eight of the locks, called Neptune's staircase, occur in succession near the w. end of the canal. Some large mountain streams between lochs Eil and Lochy are conducted in huge culverts under the canal; and by a new cut, the Lochy water is turned into the Spean. The practicability of this great work was first shown by a survey under government in 1773 by the celebrated James Watt; but it was not till 1803 that it was begun under Mr. Telford. The whole line was opened for ships in 1823. After three years of repair, it was reopened in 1847. Ships of 500 to 600 tons, fully laden, can pass through the canal. The canal and tonnage rates for sailing vessels are each a farthing per mile per ton, and a half of this for vessels under 125 tons. Steamers pay 2*s.* a ton. Of £1,368,203 expended on this canal, from 1803 to 1856, £1,242,387 were voted by parliament, and £90,748 were from canal dues. Heavy gales and rains in Dec., 1848, and Jan., 1849, did much damage to the canal, which was repaired by a government grant of £10,000. For the year ending April, 1876, the total income of the canal was £6741, whereas the expenditure amounted to £9307—a state of accounts by no means exceptional. There is regular steam communication by the canal between Glasgow and Inverness. The scenery is wild and romantic on both sides of the canal, and has many other objects of interest to the tourist, such as fort William, Ben Nevis, Inverlochy castle, Tor castle, the ancient seat of Cameron of Locheil, Glen Spean, Glen Roy, with its parallel roads, fort Augustus, the fall of Foyers, and Inverness.

CALEDONIA (NEW). See New Caledonia.

CALEDONIA SPRINGS, in Prescott co., province of Ontario, 40 m. from Montreal. They are strongly alkaline, with additions of bromine and iodine, and are much frequented by persons afflicted with scrofulous, cutaneous, and rheumatic disease.

CALEF, Robert, d. April 13, 1719; a merchant of Boston, who wrote *More Wonders of the Invisible World*, in answer to Cotton Mather's book of similar title. C.'s book was so obnoxious to the witch-persecutors of the time, that it was publicly burned at Harvard, by order of Increase Mather, the president of the college, but it was of much value in ending the witchcraft delusion.

CAL'EMBOURG, or Cal'embour, the French name for a pun (q.v.).

CALENDAR (from Cleands, q.v.), the mode of adjusting the months and other divisions of the civil year to the natural or solar year. The necessity of some division and measurement of time must have been early felt. The phases or changes of the moon supplied a natural and very obvious mode of dividing and reckoning time, and hence the division into months (q.v.—see also Week) of 29 or 30 days was, perhaps, the earliest and most universal. But it would soon be observed that, for many purposes, the changes of the seasons were more serviceable as marks of division; and thus arose the division into years (q.v.), determined by the motions of the sun. It was soon, however, discovered that the year, or larger division, did not contain an exact number of the smaller divisions or months, and that an accommodation was necessary; and various not very dissimilar expedients were employed for correcting the error that arose. The ancient Egyptians had a year determined by the changes of the seasons, without reference to the changes of the moon, and containing 365 days, divided into twelve months of 30 days each, with five supplementary days at the end of the year. The Jewish year consisted, in the earliest periods, as it still does, of twelve lunar months, a thirteenth being from time to time introduced, to accommodate it to the sun and seasons; this was also the case with the ancient Syrians, Macedonians, etc. The Jewish months have alternately 29 and 30 days; and in a cycle of 19 years there are seven years having the intercalary month, some of these years having also one, and some two days more than others have, so that the length of the year varies from 353 to 385 days.—The Greeks, in the most ancient periods, reckoned according to real lunar months, twelve making a year; and about 594 B.C., Solon introduced in Athens the mode of reckoning alternately 30 and 29 days to the month, accommodating this civil year of 354 days to the solar year, by occasiona introduction of an intercalary month. A change was afterwards made, by which three times in eight years a month of 30 days was intercalated, making the average length of the year 365¼ days. See Metonic Cycle.

The Romans are said to have had originally a year of 10 months; but in the times of their kings, they adopted a lunar year of 355 days, divided into 12 months, with an occasional intercalary month. Through the ignorance of the priests, who had the charge of this matter, the utmost confusion gradually arose, which Julius Cæsar remedied, 46 B.C., by the introduction of the Julian Calendar, according to which the year has ordinarily 365 days, and every fourth year is a leap-year of 366 days—the length of the year being thus assumed as 365¼ days, while it is in reality 365 days, 5 hours, 48 minutes, and 50 seconds; or 11 minutes, 10 seconds less. Cæsar gave to the months the number of days which they still have.

So comparatively perfect was the Julian style of reckoning time, that it prevailed generally among Christian nations, and remained undisturbed till the renewed accumulation of the remaining error of eleven minutes or so had amounted, in 1582 years after the birth of Christ, to ten complete days; the vernal equinox falling on the 11th instead of the 21st of Mar., as it did at the time of the council of Nice, 325 years after the birth of Christ. This shifting of days had caused great disturbances, by unfixing the times of the celebration of Easter, and hence of all the other movable feasts. And accordingly, pope Gregory XIII., after deep study and calculation, ordained that ten days should be deducted from the year 1582, by calling what, according to the old calendar, would have been reckoned the 5th of Oct., the 15th of Oct., 1582; and, in order that the displacement might not recur, it was further ordained that every hundredth year (1800, 1900, 2100, etc.) should not be counted a leap-year, excepting every fourth hundredth, beginning with 2000. In this way the difference between the civil and natural year will not amount to a day in 5000 years. In Spain, Portugal, and part of Italy, the pope was exactly obeyed. In France, the change took place in the same year, by calling the 10th the 20th of Dec. In the Low Countries, the change was from the 15th Dec. to the 25th; but it was resisted by the Protestant part of the community till the year 1700. The Catholic nations, in general, adopted the *style* ordained by their sovereign pontiff; but the Protestants were then too much inflamed against Catholicism in all its relations, to receive even a purely scientific improvement from such hands. The Lutherans of Germany, Switzerland, and, as already mentioned, of the Low Countries, at length gave way in 1700, when it had become necessary to omit *eleven* instead of ten days. A bill to this effect had been brought before the parliament of England in 1585, but does not appear to have gone beyond a second reading in the house of lords. It was not till 1751, and after great inconvenience had been experienced for nearly two centuries, from the difference of the reckoning, that an act was passed (24 Geo. II., 1751) for equalizing the style in Great Britain and Ireland with that used in other countries of Europe. It was then enacted that eleven days should be omitted after the 2d of Sept., 1752, so that the ensuing day should be the 14th. A similar change was about the same time made in Sweden and Tuscany; and Russia is now the only country which adheres to the *old style;* an adherence which renders it necessary, when a letter is thence addressed to a person in another country, that the date should be given thus:—April $\frac{1}{13}$ or $\frac{\text{June } 27}{\text{July } 9}$; for it will be observed, the year 1800, not being considered by us as a leap year, has interjected another (or twelfth) day between old and new style. See CHRONOLOGY : DATE.

The C. of the French republic remains to be noticed, which was adopted in consequence of a decree of the national convention in 1793. The midnight preceding the autumnal equinox of 1792 was fixed upon as the new epoch, from which the years were to be reckoned as the year 1, the year 2, etc. The year was divided into 12 months, each of 30 days, to which new names were given, as *Vendémiaire* (vintage month), *Brumaire* (foggy month), etc.; and instead of weeks, each month was divided into periods of 10 days, called *Primidi, Duodi, Tridi,* etc. Five *complementary* days were added at the end of each year, which were the *Fête du Génie, Fête du Travail,* etc. By Napoleon's command, this new system was abolished, and the use of the Gregorian C. resumed on Jan. 1, 1806.

CALENDAR, FRENCH REVOLUTIONARY. The French nation, in 1792, while reforming so many other of the world's customs, undertook the task of making a new calendar, professedly upon philosophical principles. The new era began with the republic at midnight of Sept. 21, 1792, and the months, seasons, and festivals were arranged as follows:

AUTUMN.

Vendémiaire	Vintage month	22 Sept. to 21 Oct.
Brumaire	Fog month	22 Oct. to 20 Nov.
Frimaire	Sleet month	21 Nov. to 20 Dec.

WINTER.

Nivose	Snow month	21 Dec. to 19 Jan.
Pluviose	Rain month	20 Jan. to 18 Feb.
Ventose	Wind month	19 Feb. to 20 Mar.

SPRING.

Germinal	Sprout month	21 Mar. to 19 April.
Floréal	Flower month	20 April to 16 May.
Prairial	Pasture month	20 May to 18 June.

SUMMER.

Messidor	Harvest month	19 June to 18 July.
Fervidor, or Thermidor	Hot month	19 July to 17 Aug.
Fructidor	Fruit month	18 Aug. to 16 Sept.

SANSCULOTIDES, OR FEASTS DEDICATED TO.

Les Vertus	The Virtues	17 Sept.
Le Génie	Genius	18 Sept.
Le Travail	Labor	19 Sept.
L'Opinion	Opinion	20 Sept.
Les Récompenses	Rewards	21 Sept.

This calendar existed until the 10th Nivose, year of the republic XIV. (Dec. 31, 1805), when the old system was restored by Napoleon.

CALENDAR OF PRISONERS, in the practice of the criminal law in England, is the technical name given to the list of all prisoners' names in the custody of the sheriff of each county, prepared for the assizes. When the business is over, and the trials concluded, the clerk of assize makes out in writing four lists of all the prisoners, with separate columns, containing their crimes, verdicts, and sentences, leaving a blank column, in which, if the judge has reason to vary the course of the law, he writes opposite the names of the capital convicts—*to be reprieved, respited, transported*, etc. These four calendars, being first carefully compared together by the judge and the clerk of assize, are signed by them, and one is given to the sheriff, one to the jailer, and the judge and the clerk of assize respectively keep another. If the sheriff receives afterwards no special order from the judge, he executes the judgment of the law in the usual manner, agreeably to the directions of his calendar. In every county this important subject is settled with great deliberation by the judge and the clerk of assize, before the judge leaves the assize-town; but probably in different counties, with some slight variation, as in Lancashire, no calendar is left with the jailer, but one is sent to the home secretary.

CALENDERING is the term applied to the process of finishing by pressure the surface of linen, cotton, and other textile fabrics, It is usually done by passing the fabric between cylinders pressed together with great force; hence the origin of the term, which is a corruption of *cylindering*.

The familiar domestic processes of starching and ironing afford the simplest illustrations of the object and result of calendering. The domestic mangle effects the same object as the flat iron, and is a near approach in construction to the C. engines of the manufacturer, no traversing-box of stones being used in the new patent mangles.

The cylindrical C. machine is said to have been introduced into this country by the Huguenots, driven here by persecution. The cylinders were originally of wood, but the liability to warping is a strong objection to them.

The modern calender usually consists of 4, 5, or 6 cylinders or "bowls," set vertically in a strong iron frame, with suitable driving gear, and furnished with weights suspended over a pulley to produce the required pressure. This sometimes amounts to, or even exceeds, 20 tons, including the weight of the rollers. In a 5-roller machine, the arrangement is this: The center roller is of iron or copper, made hollow for the admission of steam or a red-hot heater, the one immediately above and that directly below it are of paper; and the remaining two, one at the top and the other at the bottom, are of cast-iron. At least one of the rollers is always of paper, as it has more elasticity than metal, and is not liable to warp, like wood. It consists of sheets of brown paper or pasteboard, densely packed and compressed on an iron axis. The edges of these form the surface of the roller, which is turned and polished, an operation of some difficulty.

Before the final rolling in the C. machine, the fabric is first lightly smoothed by passing over warm cylinders. Cotton goods are starched with a starch prepared from flour, and the starch is sometimes thickened with plaster of Paris, porcelain clay, or a mixture of these, to give a fictitious appearance of stoutness, which of course vanishes when the article is washed. For ordinary C. the fabric is then simply passed between plain cylinders, which produces the desired effect by flattening the otherwise round threads. When, by means of a hot cylinder, with a pattern raised upon it, the amount of this flattening is unequal on different parts of the cloth, the beautiful effect known as "watering" is the result. *Glazing* is produced by combined rubbing and pressure; the rollers, one of which is heated, being made to move with different velocities, so that one side of the fabric is rubbed as well as pressed by the roller whose surface moves with the greater rapidity. Before the invention of these rubbing cylinders, glazing was effected by rubbing the surface of the fabric with a polished flint. Calendering is done on a very large scale in some manufacturing towns, such as Manchester and Glasgow. In Dundee, where half a century ago it was not the custom to calender the linen at all, there are now more than 1000 hands employed in this branch of industry. Machines similar to the one above described, but with all the rollers of iron, and also called calenders, are used for rolling india-rubber into sheets for coats, shoes, etc.

CAL'ENDS. The Romans made a threefold division of the month into *calends, nones,* and *ides.* The C. always fell upon the 1st of the month; the nones in Mar., May, July, and Oct., on the 7th; and the ides on the 15th; and in the remaining months, the nones on the 5th, and the ides on the 13th. The C. were so named because it was an old custom of the college of priests on the first of the month to *call* (or assemble) the

people together to inform them of the festivals and sacred days to be observed during the month; the nones received their name from being the *ninth* day before the ides, reckoned inclusively; and the ides from an obsolete verb, signifying to divide, because they nearly halved the month. This threefold division also determined the reckoning of the days, which were not distinguished by the ordinal numbers first, second, third, etc., but as follows· Those between the C. and the nones were termed *the days before the nones;* those between the nones and the ides, *the days before the ides;* and the remainder, *the days before the C.* of the next month. Thus, the ides of Jan. happening on the 13th of that month, the next day would not be termed by a Latin writer the 14th, but *the 19th before the C. of Feb.*, reckoning inclusively, i.e., reckoning both the 14th of Jan. and the 1st of Feb., and so on to the last, which was termed *pridie calendas.*

Ad calendas Græcas, a Roman proverbial saying, practically equivalent to "never." The Roman C. were often appointed as days for payment of rent, interest, etc.; but as the Greeks had no C., a postponement of payment *ad calendas Græcas*, simply meant a refusal to pay altogether. It is said that the emperor Augustus frequently used the phrase, which afterwards became a proverb.

CAL'ENTURE, a Spanish term (*calentura*) applied to a species of temporary delirium or fever occurring on board ship in hot climates, and probably due to the effect of exposure to the direct rays of the sun. The descriptions of the disease seem rather fanciful and contradictory, and the term is nearly obsolete. See *Dictionnaire des Sciences Médicales.*

CALEPI'NO, Ambrogio, 1435–1511, an Augustine monk who devoted his life to making a polyglot dictionary. The latest edition comprises 11 languages, some of them added by Passerat and others.

CALHOUN, a co. in n.e. Alabama, on Coosa river, and Selma, Rome and Dalton railroad; 1170 sq.m.; pop. '80, 19,591—5440 colored. Surface uneven and in some parts mountainous. Productions agricultural. Marble, limestone, lead, and iron abound, and some gold has been discovered. Co. seat, Jacksonville.

CALHOUN, a co. in s. Arkansas, on the Washita and Moreau rivers; 600 sq.m.; pop. '80, 5671—2088 colored. Surface rolling or level, and soil good; productions agricultural. Co. seat, Hampton.

CALHOUN, a co. in w. Florida, on the gulf of Mexico, w. of Appalachicola river; 464 sq.m.; pop. '80, 1579—396 colored. Surface level and fertile, producing corn, tobacco, etc. Co. seat, Abe's Spring.

CALHOUN, a co. in s.w. Georgia; 300 sq.m.; pop '80, 7024—4670 colored. It is level, with fertile soil, but little cultivated. Co. seat, Morgan.

CALHOUN, a co. in s.w. Illinois, between the Illinois and Mississippi rivers; 260 sq.m.; pop. '80, 7471. Near the rivers the land is low and subject to inundation; in other parts marked by high bluffs and table-lands. Productions agricultural. There are coal-fields in the w. section. Co. seat, Hardin.

CALHOUN, a co. in w. Iowa, on Coon river and the Dubuque and Sioux City railroad; 600 sq.m.; pop. '70, 1602; in '80, 5595. Productions agricultural. Co. seat, Lake City.

CALHOUN, a co. in s.w. Michigan, on St. Joseph river and the Peninsular and Michigan Central railroads; 720 sq.m.; pop. '80, 38,452. Soil rich; surface generally level; productions agricultural. Co. seat, Marshall.

CALHOUN, a co. in n. Mississippi, on the Yallabusha river; 800 sq.m.; pop. '80, 13,492—3301 colored. Productions, corn, cotton, butter, etc. Co. seat, Pittsboro.

CALHOUN, a co. in s.e. Texas, on the gulf of Mexico and including Matagorda island; 684 sq.m.; pop. '80, 1739—548 colored. Surface level, and soil poor with little timber. The San Antonio and Gulf and the Indianola railroads traverse the county. Co. seat, Indianola.

CALHOUN, a co. in w. West Virginia, on the Little Kanawha river; 300 sq.m.; pop. '70, 2939; in '80, 6074. An agricultural region. Co. seat, Grantsville.

CALHOUN, John Caldwell, an eminent American statesman, descended from an Irish family who founded the Calhouns' settlement in South Carolina, was b. at Abbeville, S. C., Mar. 18, 1782. Having gained distinction at the bar, he was sent to congress in 1811, where he soon made himself the leader of the war-party against England. Author of the tariff of 1816, so favorable to his native state, he in 1817 was named minister of war by president Monroe, and reduced the confused state of affairs in his department to order, and made a great reduction in the expenditure of the army without sacrificing its efficiency.

The early part of C.'s career was marked by broad and patriotic views, to which his subsequent preference of southern interests presented an unfavorable contrast. The tariff of 1828 not being very favorable to the southern states, C. still adhered to the government, hoping that the president, Jackson, would veto the measure; but as this hope was disappointed, C. went to South Carolina, and there (1829) carried in the legislature the notorious resolution, "that any state in the union might annul an act of the Federal

government." To this decision, Virginia, Georgia, and Alabama gave in their adhesion, and threatened the dissolution of the union. President Jackson promptly used energetic measures to make this resolution of no effect. C. lost popularity, and despairing of reaching the presidency, resigned his vice-presidency; but soon afterwards was elected to the senate. In 1838, he delivered his famous speech on slavery, and continued to agitate on behalf of the slave-holding interest and for a dissolurion of the union, both with voice and pen, until his death, which took place at Washington, Mar. 31, 1850. In his private character, C. was blameless; but in his career as a statesman he is understood to have implanted in the minds of his partisans those principles which culminated in the late war for the dissolution of the union. During many years, he had been employed in writing his work on *The Philosophy of Government*, in which he vindicates the doctrine of state sovereignty, and which, along with other works, was posthumously published.

CALHOUN, SIMEON HOWARD. See page 886.

CALIA'NO, a small t. of the Austrian Tyrol, situated on the left bank of the Adige, about 9 m. s. of Trent. It figures in history as the place where the Austrian archduke, Sigismund, won a signal victory over the Venetians in 1487. Being a place of considerable military importance, it was also contested in the campaigns of 1797 and 1809.

CALIBRE, or CALIBER, is a technical name for the diameter of the bore of a fire-arm, whether a piece of ordnance or a small-arm. The ordnance from which solid shot are projected are usually denoted by the weight of each shot, as 24-pounder, 68-pounder, etc.; but mortars, and such guns as project shell or hollow shot, are more usually denoted by the C., such as 13-inch mortar, 10-inch shell-gun, etc. The C. of the chief kinds of fire-arm will be noticed under the proper headings; but it may here be observed, generally, that the C. of English ordnance has been greatly increased within the last fifty years, partly by boring up old guns, and partly by casting new.

CALICO-PRINTING is that department of the art of dyeing which takes cognizance of the production of a colored pattern on cloth. It appears to have been first practiced at *Calicut* in India—hence the term *calico;* and the *pallampoors*, or large cotton chintz counterpanes, which have been manufactured in the East Indies for centuries, are evidence of the successful practice of the art in that country. From the East Indies, the art spread to Asia Minor and the Levant, thence to Augsburg in Bavaria; from whence, at the beginning of the 18th c., it spread to Alsace in France, to Switzerland, and ultimately to England and Scotland. The term is strictly applicable to the production of colored patterns on cotton cloth or calico; but as now employed, it includes all the processes followed in the formation of a colored pattern on cotton, linen, worsted, and silk goods, as also mixtures of two or more of these, such as the fabric called *de laine*, which is composed of cotton and worsted.

The first operation connected with the printing of cloth is the removal of the surface hairs or minute threads which communicate a fibrous down or nap to the surface of the cloth, and if allowed to remain, would interfere with the uniform application of the colors. The surface down is got rid of by the process of singeing, during which the cloth is drawn over a red-hot iron or copper bar or plate, or through a series of gas jets. The apparatus generally used for *hot-plate singeing* consists of a furnace surmounted by a metal plate, which is sometimes ridged on the surface. The cloth having previously been joined at the ends, to make a long length, and been placed on a winch-roller, is first brought in contact with roller brushes, which raise the nap on the cloth, then passes over the white-hot metal cylindrical bar, and is wound on to a second winch-roller. The process is repeated twice on the face of the cloth, being the surface to be printed on, and once on the back. *Gas-singeing* is accomplished by drawing the cloth through brushes, and then over a horizontal pipe, perforated with rows of small holes, or slit from end to end, so that the gas issuing therefrom burns as a narrow sheet of flame. The cloth is not only allowed to come in contact with the burning gas, but the flame is transmitted through the cloth, and a suction-apparatus is often placed immediately above, so as to draw the flame through more effectually. When well singed, the cloth undergoes the process of bleaching (q.v.), and is thereafter calendered. See CALENDERING.

There are several modes of applying the colors to cloth, and these are respectively named—1. The madder style; 2. The padding style; 3. Topical style; 4. Resist or reserve style; 5. Discharge style; and 6. China blue or pottery style. These various processes are at one in being intended to fix upon the cloth the different colors; but they differ from each other more or less in the several steps through which the cloth is passed, though occasionally there is little or no line of separation; and at times the cloth is treated by one method, and subsequently by another style.

The *madder style* is that in which a certain fixing agent or mordant is printed on the cloth, which is then introduced into the coloring matter in a dye-vat, when the mordant, having an attraction alike for the fiber of the cloth and for the coloring matter, acts the part of glue or paste, and cements the color to the cloth. Originally, madder was the only coloring substance employed in this style; but nowadays, by far the greater number of dyestuffs, vegetable and animal, including cochineal, logwood, etc., are attached to cloth in this manner. The fixing agents or mordants generally employed are different strengths of *red liquor* (acetate of alumina), *iron liquor* (acetate of iron), and mixtures of these. These are thickened with wheat-starch, potato-flour, roasted starch or dextrine,

and gum-arabic, so that the mordant may not run when it is placed on the cloth by the pattern-block or by the printing-machine. After the mordant has been imprinted on the cloth, the latter is hung in a warm airy room, where it can easily dry, but where it is at the same time surrounded by a moist atmosphere. The result is, that the mordant is decomposed, the acetic acid is evolved, and the alumina or iron is left attached to the fiber of the cloth in the state of an insoluble sub-salt, which cannot be dissolved by water. As some of the mordant is still left in its original soluble condition, it is necessary to wash the cloth free from this, else, during the dyeing operation, the soluble part of the mordant would run on to those parts of the cloth not intended to be colored, and thus produce a blotted appearance. To obviate this, the cloth, having undergone the process of *drying and aging*, is then introduced into a vat containing water, through which is diffused some cow-dung, dung substitute—a preparation of bone ash, sulphuric acid, carbonate of soda, and glue—or bran. The result of this process of *dunging* is the removal of the soluble part of the mordant, as also the starch or thickening agent, leaving the decomposed or insoluble mordant adhering to the fiber. The terms *dung*-fixing, *substitute*-fixing, and *bran*-fixing, have reference to the employment of one or other of these agents at this stage of the operation. When the cloth has been well washed from the dunging, it is introduced into the vat or dye beck containing the coloring matter. The whole is heated by steam-pipes, and the cloth being placed on a sparred reel kept in motion, is repeatedly wound out of the vat, and returned thereto. The result is, that wherever the mordant adhered to the cloth, the coloring matter is attached thereto, and little or no trace of color adheres to the unmordanted parts. The last operation is the *clearing* or *brightening*, during which the colored cloth is introduced into warm baths of water containing soda, soap, or, for the more delicate tints, bran, and is thereafter acted on by weak acid solutions. The object is to clear the colors, and at the same time to confer upon them the property of resisting the fading action of the air and sun for a much longer time. The different shades of color which can be obtained from the same madder beck or vat, with different mordants, are very numerous, and include reds, lilacs, purples, chocolates, and blacks. Thus, when a weak solution of red liquor (acetate of alumina) is employed as the mordant, a light red tint is procured; with a stronger aluminous mordant, a deep red is formed on the cloth; with a more or less dilute solution of iron liquor (acetate of iron), the cloth is colored lilac, violet, or purple; with a strong solution of iron liquor, black is obtained. Indeed, the same piece of cloth stamped in different places with the various strengths of aluminous and iron mordants, and mixtures of these, and immersed in the madder-bath, will be obtained dyed with all the shades mentioned; and in this manner many of the beautiful variegated colored dresses and handkerchiefs are prepared for market.

The *padding style* in calico-printing is intended mainly for the impregnation of cloth, in whole or in part, with mineral coloring substances. When the cloth is to be entirely colored, it is immersed wholly in a vat containing the mordant. When the color is to appear as a pattern on the fabric, the mordant is applied by a pattern block, or by the printing-machine. In either case, the cloth is thereafter thoroughly dried, and washed in various solutions, and then introduced into a vat containing the substance to form the color. Thus, if a piece of cloth is to be entirely impregnated with *chrome yellow*, it is first treated or *padded* in a solution of 8 parts of bichromate of potash ($KO,2CrO_3$) to a gallon of water, dried, and then placed in a vat containing a solution of 6 or 8 ozs. of acetate or nitrate of lead ($PbO\overline{A}$, or $PbONO_5$) to the gallon of water. The result is that the chromate of lead ($PbOCrO_3$) is formed in the tissue of the cloth; and when the latter is washed and dried, the yellow color still adheres to the cloth firm and fast. To print a yellow pattern on cloth, 7 to 9 ozs. of acetate of lead, and the same quantity of nitrate of lead, are dissolved in a gallon of water, thickened with starch, and placed upon the cloth according to pattern. After drying, the cloth is first immersed in water containing a little carbonate of soda, and ultimately in a solution of bichromate of potash, when the pattern becomes fixed in bright yellow, insoluble in water. To produce *Prussian blue* on cloth, it is treated with acetate and sulphate of iron, dried, washed with warm chalk-water, and immersed in a very weak solution of yellow prussiate of potash. A pattern in Prussian blue is produced by printing a pattern in the cloth with the iron solutions thickened with gum, and thereafter proceeding as above. Chrome green is produced in a similar way, by using sulphate and acetate of copper, thickened with glue, and thereafter arsenious acid with potash; and so also other colors, such as iron buff or chamois, manganese bronze, etc.

The *topical style* in calico-printing is the process whereby certain coloring matters which are insoluble in water, and cannot therefore be applied to cloth by the modes suggested under the madder and padding styles, are treated at once with the mordant, and the mixture by one operation transferred by block, or otherwise, directly on the surface or *top* of the cloth, and hence the term *topical*. Indigo, safflower, and arnotto are instances of such insoluble coloring substances; and when these and other dye-stuffs, such as logwood and Brazil wood, are treated with water, thickened with starch and nitro-muriate of tin (known as *spirits*) added, with occasionally a little of other salts, such as nitrate of copper, the result is the formation of *spirit-colors*, which can be printed on the surface of cloth, and possess a certain degree of fixity. The permanency of these *spirit-colors*, however, is very much increased, and the general appearance improved, by after-

wards subjecting the goods to the action of steam in a wooden chest or box, when the term *steam-colors* is applied.

The *resist style* in calico-printing is that in which certain materials are placed on the surface of cloth, to protect it from the adherence of the mordants, and, consequently, to keep that part of the cloth from being attacked by the coloring matter. These materials are termed resists, reserves, or resist-pasters, and they are divisible into mechanical and chemical. The *mechanical resists* are such substances as fats, resins, oils, wax, and pipe-clay. A common resist for silk and woolen goods is a mixture of 2½ of resin and 1 of suet; and it is principally in the color-printing of silk and woolen dresses and handkerchiefs that mechanical resists are employed, though they are occasionally used for the printing of cottons. The chemical resists may act on the mordant or on the color. Thus, if it be desirable to remove the mordant, and thus leave certain parts of the cloth unable to attach color, the printing of a pattern with some acid substance on the cloth will form with the mordant a soluble salt, which can be readily removed by washing, whilst the parts which have not been so acted on by acid are not dissolved away by the washing, and still retain the full power in the color-vats to cause the adhesion of the color. For this purpose, where an iron or aluminous mordant has been employed, it is customary to print thereon in the requisite pattern, lemon-juice or lime-juice (containing citric acid), tartaric or oxalic acid, and bisulphate of potassa, or a mixture of two or more of these, thickened with pipe-clay, China-clay, gum-arabic, dextrine (British gum), gum-senegal, or a mixture of these; occasionally, chloride of tin is employed. Sulphate of zinc, sulphate and acetate of copper, and the chloride of mercury, are used to resist the adherence of indigo blue.

The *discharge style* in calico-printing comprehends the employment of similar materials to those used in the resist style, but *after* the cloth has been colored or dyed, and for the purpose of discharging the color, or bleaching the cloth at certain parts, according to pattern. The dischargers for organic coloring matters are chlorine and chromic acid. The chlorine is employed in the form of bleaching-powder (q.v.), and the cloth already dyed is printed with a solution of tartaric acid (or other acid), thickened with pipe-clay and gum, then dried, and passed through a solution of bleaching-powder, when the decoloration occurs, as already explained under BLEACHING. The chlorine is also applied by placing a number of folds of colored cloth between perforated pattern-plates, and subjecting the whole to great pressure; a solution of chlorine (obtained by adding an acid to a weak solution of bleaching-powder) is allowed to percolate down through the perforations of the plates, and the cloth immediately underneath, so that only those spots are bleached, while the rest of the cloth is so highly compressed as to keep the liquid from coming in contact therewith. The well-known Turkey-red handkerchiefs are *patterned* in this way. The chromic acid is generally employed in discharging indigo color. The cloth, already entirely blue, is soaked or padded in bichromate of potash, and then an acid discharger printed thereon; and wherever the acid discharger (tartaric, oxalic, citric, or hydrochloric acid) comes in contact with the blue cloth containing the bichromate of potash, chromic acid is liberated, and destroys the color. Instead of acting upon the colored cloth, the discharger may be employed to carry off the mordant. Thus, cloth treated wholly with a mordant, and thereafter printed with a pattern in acid, has the mordant removed at those parts where the pattern block has placed the acid. Mineral colors can also be discharged in a similar way.

The *China blue or pottery style* in calico-printing is a modification of the topical style, where indigo is deposited on cloth in the insoluble state, and is thereafter manipulated with, so as to impregnate the cloth with the indigo more or less strongly, and thus produce different shades of blue.

The above descriptions of the various operations in calico-printing have special reference to cotton cloth; and though many steps of the manipulative processes apply equally well to linen, silk, worsted, and de laines (worsted and cotton), yet considerable modifications in mode of treatment and material employed are required in the successful color-printing of all texture containing animal fiber, such as silk and wool. Where the printing of such fabrics differs essentially from the processes already indicated, special reference will be made under SILK and WOOL. The different coloring matters employed in calico-printing being identical with those used in dyeing, will be considered under the general popular title DYE-STUFFS; and the mode of compounding these into the various colors and shades, will be more appropriately introduced under DYEING.

CALICUT, a seaport of the district of Malabar, which, though on the w. side of the peninsula of Hindustan, yet forms part of the presidency of Madras. In lat. 11° 15′ n., and long. 75° 50′ e., it is distant from Goa and Bombay respectively 300 and 566 miles. It was the first spot in India visited by Vasco da Gama, being then the chief emporium on the coast, with stately dwellings and magnificent pagodas. So populous and powerful was it, that it twice repulsed the Portuguese, slaying their commander in 1509, and expelling Albuquerque himself, after a momentary success on his part, in 1510. It stands near the mouth of a small river of the same name, appearing to have possessed at one time a tolerably good haven. Gradually, however, this harbor has been filled up with sand; and now its anchorage is merely an open roadstead, at a distance, at least

for large vessels, of 2 or 3 m. from land. Independently of this physical disadvantage, the ravages of war and the competition of superior localities contributed to the decay of Calicut. Accordingly, in 1792, when it fell into the hands of the English, the city was little better than a ruin. Since then, it has made considerable progress, and in 1871 was found to have 47,962 inhabitants. From C. *calico* is understood to have derived its name, just as *cambric* from Cambrai, in the n.e. of France.

CALIFORNIA. This name was at first applied to a peninsula on the w. side of Mexico, but was gradually extended to an indefinite portion of the adjoining continent, as far n. as the parallel of 42°. The original C., however, and its augmentation were distinguished from each other as old and new, lower and upper. In 1848, partly by conquest and partly by purchase, continental C., down to the parallel of 32° 28′, was ceded to the United States. After existing as a *territory* for two years, it was, in 1850, constituted one of the United States, bounded n. by Oregon, e. by Nevada and Arizona, s. by Lower C., and w. by the Pacific. Between the two Californias of the present day, the American one and the Mexican one, there is nothing in common but the name.—1. *Mexican C.* is the peninsula above mentioned, which, though considerably longer than Great Britain, is yet so narrow as to be very little larger than Scotland. From end to end, it is one ridge of mountains, which here and there rise to about 5000 ft. above the sea. A few favored spots yield fruits and grains in abundance; but, generally speaking, the productions are unimportant, for even trees, and those of no great size, are found only towards the southern extremity of the country. The population does not exceed 25,000—the oldest and most considerable town, Loretto, on the e. side, containing barely 1000 inhabitants. On the w. side is the magnificent harbor, peculiarly valuable on a coast so destitute of shelter, formed by the bay of Magdalena and the island of Santa Margarita.—2. *American C.*, vaguely claimed, under the name of New Albion, by Drake for England in 1579, lay unoccupied till 1767, when it was invaded by Franciscan friars, the successors in Mexico of the newly expelled Jesuits. These zealous apostles, backed, when necessary, by armed coadjutors, planted various missions, bringing under their influence, such as it was, the great mass of the aborigines. Under such circumstances, the new province became pre-eminent, even in Spanish America, for everything that could paralyze the progress of a community. Anglo-Saxon speculators engrossed most of the trade; American trappers walked through the land as if it had been their own; the Muscovites established, in the n., a town under the ominous title of *Ross* or *Russia;* and a Swiss adventurer of the name of Sutter, who had carved out for himself a *New Helvetia,* virtually set the government at defiance. But the discovery of gold in Sutter's mill-race during 1847, and the political transfer of 1848, taken together, changed, as if by a miracle, the aspect of affairs. The matchless harbor of San Francisco became the grand mart on the Pacific, presenting a center of attraction to the restless and energetic of every race and every clime. Between 1850 and 1855, the population increased from 92,597 to 327,000; in 1870, it was 560,247; and in 1875, it was above 800,000, of whom 75,000 were Chinese. The total yield of gold in this state up to 1883 was about $1,127,000,000. In 1874, the value of the gold and silver produced was $20,300,531, and in 1875, $17,753,151. C. possesses the richest quicksilver mine in the world—that of New Almaden—which at one time produced from 2,500,000 lbs. to 3,500,000 lbs. per annum. It now yields about 1,000,000 lbs. In 1864, 15,000 tons of copper were exported, to be smelted at Swansea and Boston, but not nearly so much is now produced. Platinum has been found in many of the placers. There is coal in nearly all the coast counties; and asphaltum is produced by many springs along the southern coast. Other mineral products are iron, tin, and borax. The yield of wheat in 1870 was 16,676,702 bushels; of barley, 8,783,490. In the year 1875, 8,000,000 gallons of wine were made, the product of 30,000,000 vines. Silk culture is making rapid progress; and the woolen factories of C. consume nearly 6,000,000 lbs. of wool annually, while about 30,000,000 lbs. are exported. Manufacturing industry has lately greatly increased, the chief manufactures being woolen goods, flour, iron, glass, wine, sugar, and silk. The amount of taxable property, real and personal, as assessed in 1878, was $584,583,651. The state debt amounted in the same year to $3,403,000.

The country is mountainous, and is cut into coast and interior by a subordinate range from Oregon. The interior is subdivided into the valleys of the Sacramento and the San Joachim—two rivers from the n.e. and the s.e., which enter the noble haven of San Francisco. The former is the chief seat of the "diggings." Since the completion of the Pacific railway, terminating in San Francisco, C. has been visited by many pleasure-seekers, attracted by its magnificent scenery. The most celebrated district is the Yosemite valley (q.v.). C., with a lovely and salubrious climate, produces fruits and grains freely, under advantageous circumstances of soil and situation. In the growth of timber, however, it appears to be almost unrivaled. Fremont measured one tree that was 21 ft. in diameter, or 66 in circumference; and another has been seen, which, with a length of 150 yards, is nearly 120 ft. in girth. A *sequoia gigantea* in Mariposa county is 274 ft. in height. Besides San Francisco, the state contains the cities of Sacramento (the capital), Oakland, Stockton, San José, Los Angelos, Marysville, and San Diego, with the second best port in the state. There are several Protestant and Catholic colleges in C., and education is progressing.

PACIFIC STATES AND TERRITORIES.

Railroads thus

Scale of Miles

0 50 100 150 200

126 123 120 117 114 111 108 105 102

50 47 44 41 38 35 32

Longitude West of Greenwich

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CALIFORNIA (*ante*). This name, originally given to a portion of western North America, was apparently taken from a Spanish romance published in 1510, in which the author speaks of "the great island of C., where a great abundance of gold and precious stones is found." The coast of the present C. was explored by Cabrillo, in 1542, as far up as cape Mendocino, in 42° north. In 1578, sir Francis Drake, who was plundering Spanish commerce, coasted along as far as 48° n., and landed to refit his ships either in sir Francis Drake's bay or the bay of San Francisco—probably in the former. In 1602, the bays of San Diego and Monterey were discovered by Viscaino, and then came an interval of a century and a half before settlements began to be made. The Jesuits, who had missions in lower C., made some settlements in the present C. about 1760; but in 1767 they were expelled from the country by the order of the king of Spain, and their property was turned over to the Franciscans, who established a number of missions, and prospered well until Mexico became independent (1822); thenceforward they rapidly declined, and in 1840 were broken up altogether. The treatment of the natives by these missions was such as to promote their worldly welfare, but was not especially notable for intellectual improvement; indeed, it is charged that the Indians were little better than slaves under this rule. There were in all 21 missions, the first founded in 1769, the last in 1820. They were all on or near the coast or bay of San Francisco, and the priests displayed excellent judgment in selecting for their settlements the best garden spots in the country. The Indian population was large until about the time of the cession to the United States. In 1734, the Indians drove out the Jesuit missionaries, but they returned very soon and succeeded in collecting and to some extent civilizing many of the natives, so that 40 years ago the "mission" Indians numbered about 30,000. The aborigines in northern C. were much superior to those in the south. Under Mexican rule the Indians were recognized as owners of their lands, but the United States never acknowledged the right, and now the aborigines are homeless. In 1870, there were 29,000 Indians in all the states. The principal tribes were the Klamaths, the Hoopas, the Ukies, the Redwoods, the Tulés, the Tejons, the Siahs, the Wylackies, the Concows, the Wichmunies, the Coweas, and the Yokas.

California was very little known on this side of the continent until within the past 35 years. Half a century ago, about all the trade with C. was from Boston, whose merchants sent out groceries and cotton goods in exchange for furs, the voyage around cape Horn lasting two years or more. Now and then a wandering American or Englishman would settle in C., and a few daring adventurers found their way across the continent, so that by 1830 it was thought there were as many as 500 foreigners w. of the Sierra Nevada.

The territory was once seized by the United States, but was relinquished the next day. This was in 1842, when commodore Jones of the American navy captured the fort at Monterey, and hoisted the stars and stripes; but the next morning he hauled down his flag, and apologized for the mistake. It was about this time that three nations, the United States, France, and England, were looking with peculiar interest at the Californias, upper as well as lower. Both the European powers were suspected of coveting possession, a thing the United States could not tolerate. The result was that about the time war was declared against Mexico, col. Fremont, who was conducting a scientific expedition on the Pacific coast, received—in May, 1846—certain instructions by an officer who had landed from a national ship at Vera Cruz, and crossed the land to Mazatlan; whereupon Fremont abandoned his investigations and made his way to Sonoma, where he organized a battalion of mounted riflemen, and on the 5th of July recommended a declaration of independence. On the 2d of that month commodore Sloat in a United States frigate put in at Monterey, and on the 7th hoisted the stars and stripes with no intention of imitating his predecessor's example by pulling them down. He issued a proclamation declaring C. to be from that time forward a part of the United States. Some little fighting was had with the Californians, and there arose a bitter discussion among army and navy officers concerning their part in the conquest of the country. Fremont brought trouble on himself by obeying the orders of commodore Stockton (who had superseded Sloat) instead of those of gen. Kearney, who ranked him and assumed command. Kearney preferred charges, and Fremont was tried by court-martial, which found him guilty of "mutiny and disobedience of the lawful command of a superior officer." The president rejected the finding as to the mutiny, and remitted the penalty on the other count, but Fremont refused the clemency and resigned. He afterwards conducted several famous overland expeditions, which met great sufferings, and was so much connected with Californian affairs that the people almost everywhere considered him the real conqueror of the territory.

At the end of the war the annexation of C. to the United States came with the treaty of peace, ratified May 19, 1848, and then the question became pressing whether it should be a free or a slave state—a question hotly discussed long before. Up to the adjournment of congress, on the 4th of Mar., 1849, nothing had been done towards organizing either state or territorial government except making San Francisco a port of entry, and extending the customs and revenue laws over the country. The people of C. then took affairs into their own hands, and in Sept. of that year held a convention, which framed a state constitution in which slavery was expressly forbidden. On the 7th of Sept., 1850, a bill was passed by congress admitting C. as a state without slavery, but

leaving New Mexico and Utah (organized into territories on the same day) open to its introduction. This legislation was the "omnibus bill" and a part of the famous compromise measures through which it was hoped that the question of slavery would be permanently settled, or at least removed from discussion in congress.

The discovery of gold at capt. Sutter's mill, in Feb., 1848, attracted towards C. a tide of emigration unparalleled in modern times. From 40,000 a year or two before the war, the white population rose to 323,000 in 1860, and 500,000 in 1870. The gold fever was the phenomenon of the age. The emigrants were nearly all young or middle-aged men, scarcely a hundred women going out for the first year or two. Nine tenths of the adventurers rushed at once to the mines, or prospected for new ones. The organization of society was neglected, and in many places the only law was the momentary decision of the people themselves. Fortunes were made in a day, and the golden stream flowed eastward with steady and rapid increase, so that the gold production of the United States for the 17 years from 1849 to 1875 averaged $15,600,000 per year. In 1853, the product of the C. mines was $65,000,000. All property was affected by the fever; lots in San Francisco were worth gold coin enough to carpet them; speculation ran wild; all forms of gambling were recognized as legitimate business; adventurers and criminals flocked in, and society became chaotic. Self-preservation soon demanded order, and the celebrated vigilance committee enforced it. The latest of those committees assumed the proportions of a regular government, and resisted the efforts of the state power to disband it; but formally resigned near the close of 1856, after hanging four culprits, and driving hundreds of the worst from the state.

C., popularly called the "golden state," is bounded on the n. by Oregon, the line running e. on the 42d degree to the 120th parallel, thence s. to the 39th degree, thence s.e. to the intersection of the 35th degree on the Colorado river, thence along that river to the Mexican or lower California boundary about 33° n., and thence direct nearly w. to the Pacific. The extreme length from s.e. to n.w. is about 750 m., and the breadth an average of about 240 m. The area given in the census of 1870 is 188,981 sq.m., but that amount is probably too large by 25,000 sq.m. Near the coast below 34° are the islands of San Miguel, Santa Rosa, Santa Cruz, Santa Barbara, Santa Catalina, San Nicolas, and San Clementes, but none of them are important, and but one or two are under cultivation. The census of '80 gives an area of 155,980 sq. m.

The principal harbors on the Pacific are San Francisco, San Diego, Humboldt, Santa Barbara, Monterey, Bodega, San Luis Obisbo, and Tomales. The bay of San Francisco is the finest harbor on the Pacific coast. Entering by the "Golden Gate," a strait only a m. wide and 5 m. long, vessels are in a land-locked bay about 9 m. wide by 50 in length, sheltered from the ocean by land from 6 to 15 m. wide. The bay of San Pablo is a portion of that of San Francisco. San Diego, in the s., is also an important harbor. The surface of C. is generally rough. There are two mountain chains running through; the Coast range, and the Sierra Nevada, or snowy mountains, the latter forming in some parts the eastern boundary of the state. Both ranges are united at the n. and s. end. The Coast mountains are comparatively low, seldom showing peaks as high as 5000 feet. The range is near the ocean, and there are but few available harbors along the 700 m. of coast. The bay of San Francisco pierces this range, which is further divided by valleys such as the Napa, Sonoma, Los Angeles, and Salinas. In breath the Coast range is from 20 to 40 miles. The plains and valleys are fertile, and generally have a delightful climate. A lesser chain, the Mount Diablo range, is about 150 m. in length by about 25 wide. One of the prominent natural features near San Francisco is the Contra Costa range of hills, running from Carquines bay about 50 m. in a s.e. direction. Some of the higher of the Coast mountains are: Mts. Diablo, 3881 ft.; Ripley, 7500 ft.; Downie, 5675 ft.; and San Carlos, 4977 ft. All these mountains are heavily clothed in verdure, and nearly all contain minerals of value. In the n. part of the state numerous branches of the Coast range and the Sierras intermingle, rendering that portion extremely rugged. The Sierra Nevada range, starting from Mt. San Bernardino, about 34° n., runs n.w. and n., and reaches the Coast range again at 41° 15′ by a western spur. The summits of the Sierra mountains are in many instances above the snow line, and there are but few available passes. The range is about 450 m. long, and from 50 to 80 m. wide. The mountains are thickly wooded as far as trees will grow, and above the green pines shoot up bare and snow-covered granite peaks. Some of the altitudes are: Shasta, 14,442 ft.; Tyndall, 14,386 ft.; Brewer, 13,886 ft.; Dana, 13,277 ft.; Castle, 13,000 ft.; Lassen, 10,577 ft. The Johnson "pass" over this range is 6752 ft., and that of the Central Pacific is 7042 ft. above tide. Mt. Diablo, about 28 m. n.e. from San Francisco, is a lone and very conspicuous peak, affording from its summit a comprehensive and picturesque view; and the same is true of Mt. Helena, at the head of Napa valley, 60 m. n. from San Francisco.

The region between these great mountain ranges seems to have been once the bottom of a lake. It is now called the Sacramento and the San Joaquin valleys, and includes about 25,000 sq.m., reaching 400 m. n. and s., and having a width of more than 50 miles. The Sacramento and San Joaquin rivers drain this valley—the former the northern and the latter the southern portion. Near the central part of the region these rivers unite, and find an outlet through the coast mountains to the ocean. In the extreme s. small lakes and marshes cover a considerable extent. The land in this vast central basin is

remarkably fertile, and level near the large streams, but rolling and hilly towards the mountains. There is a plateau or table-land in the n. at about 41°, which is more than 100 m. long and about 5000 ft. above tide. This high plain forms a basin by itself, having no outlet for water. In the s. part of C. is another basin known as the Colorado desert. It is about 150 by 70 m., and is mostly a barren waste of sand.

The largest river is the Colorado, which forms the boundary along Arizona, and is navigable beyond the C. line. The Sacramento is navigable as far as the city of Sacramento, and the San Joaquin is available for light-draft boats nearly to the sierras. Mountain lakes are a feature of California. Lake Tahoe, on the summit of the sierras, 6200 ft. above tide, is about 20 m. long and 1500 ft. deep, and its water is exceedingly pure. The overflow passes into Truckee river, and disappears by evaporation. Other lakes are Clear, Owen's, and Mono, the latter 14 by 9 m., and 7000 ft. above the sea. In Lassen and Modoc cos. are several large alkaline lakes.

The wonderful scenery of the Yosemite valley is known the world over. This valley is in the sierras, about 150 m. a little e. of s. from San Francisco. The valley is nearly 4000 ft. above tide, and is hemmed in by almost perpendicular cliffs from 2000 to more than 3000 ft. high. The cascades in and around the valley are of great beauty and variety. Yosemite creek falls 2600 ft. in three leaps, the highest being 1500 feet. The Merced and Nevada falls combine nearly as great heights with larger bodies of water, and are surprisingly grand. A commanding object in the valley is the Half Dome, a rocky mass rising about 4750 ft. above the level, and presenting a vertical face of 1500 feet. Parallel with the Merced river, which flows directly through the valley, and a little farther n., is the Tuolumne, noted for the number and beauty of its cascades, and the picturesque scenery along its course. This river falls 4650 ft. in the course of 22 miles. Mt. Dana, over 13,000 ft. high, dominates the region above the Yosemite, and from its easily accessible summit opens a magnificent panorama of the Sierra Nevada. Mono lake is 7000 ft. below; beyond are the lofty and in some instances snow-clad peaks of the great basin, while volcanic cones are visible to the s. of the lake.

"The big trees" are another peculiar and remarkable feature of California. There are several groups or patches of these forest giants, the most important being about 30 m. n.n.e. of Visalia. They are called *sequoia gigantea*, or giant red-wood, and vary from the height of a large pine to nearly 400 ft., with circumferences at a man's height from the ground varying from 25 to more than 100 feet. One is still standing that is reported to be 376 ft. high and 104 ft. around; and remains of fallen trees show that there have been specimens considerably larger. One was cut down which was more than 24 ft. in diameter without, and about 27 ft. with, the bark, or a circumference of nearly 85 ft.; its age was nearly 1300 years. Other C. timbers are pines in large variety, black oak, ash, hickory, elm, beech, white cedar, spruce, fir, laurel, tamarack, cypress, yew, juniper, chestnut, acacia, poplar, cottonwood, walnut, maple, buckeye, etc. Of shrubs the more remarkable are the thorny manzanita and the chamiso, which form the impenetrable undergrowth known as "chaparral."

The fauna of C. is varied and extensive, and may be headed by the grizzly bear (now almost extinct). There are black, brown, and cinnamon bears; sea-lions, whose noises and gambols around Seal Rock in San Francisco bay attract thousands of sight-seers; beaver (rapidly disappearing); ground squirrels (great plagues to farmers for their burrows in the soil); gophers (a similar nuisance); mountain squirrels; elk (once abundant but nearly extinct); deer; antelope (rapidly thinning out); mountain sheep (also nearly gone); raccoons, skunks, badgers, martens, minks, weasels, wolves, musk-rats, porcupines, otters, wild cats, coyotes, foxes, rabbits, etc. Birds are abundant; those peculiar to the region are the road-runner, nearly allied to the cuckoo, but like a pheasant in habit of running and inaptitude to fly; the C. woodpecker, which bores holes in the bark of trees and fills the cavities with acorns, the object apparently being to collect food in which grubs will fatten and in due time gratify the palate of the bird. The C. vulture is the largest flying bird in North America; the sage hen is a valuable bird, and plentiful; there are two species of quail, besides eagles, hawks, owls, buzzards, crows, magpies, ravens, jays, swallows, humming-birds, robins, larks, orioles, pigeons, doves, cranes, bitterns, herons, coots, snipe, rails, sandpipers, curlews, ducks, teal, geese, the pelican, albatross, cormorant, loon, gull, petrel, etc. The rattlesnake is the only dangerous reptile, but there are many other serpents, with tortoises, frogs, toads, lizards, and salamanders. Fish are abundant, and include salmon, eels, mackerel, blackfish, perch, redfish, flounders, herring, shad, sturgeon, sharks, and sunfish. Oysters, clams, scallops, etc., with lobsters, crabs, and shrimps, are abundant.

Nearly all the gold mines are on the western slope of the Sierra Nevadas, in a belt of country about 220 by 40 m., or nearly 9000 sq.m., extending n. to Oregon. The richest section is in the middle of this auriferous belt. The gold is in a metallic condition, and mixed with silver and other metals. In the stream and alluvial deposits the metal is in fine scales, with occasional lumps; in rock it is in veins or quartz lodes. The gold in the soil is gotten out by washing, and the process is called "placer mining," from "placer," i.e., "place of deposit." Rock mining is more expensive, and requires heavy and costly machinery for crushing or grinding the quartz, from which the metal is extracted by amalgamation with quicksilver. From a single quartz mill in 1851, the number rose to 421 in 1870. Mercury is found in C. in the form of sulphuret, or cinnabar,

which is plentiful in the coast range in the s. part of the state, particularly at New Almaden. In separating gold by amalgamation, the crushed ore is put with the mercury into a revolving drum, and whirled around for a time. When the drum is opened there is found a fluid mass, which is the mercury, appearing half congealed, and containing all the gold. The mixture is poured into a retort and heat is applied, when the mercury distills over, leaving the gold in the retort. The mercury is then ready for future use. Silver has been found in many places in C., but not much attention has been given to it. There are silver and copper ores in combination in the s.e. part of the state, and very superior magnetic iron ores in the coast range and other parts. Copper and manganese have also been found, and the valuable platinum is plentiful in the valley of the Klamath. Tin, lead, zinc, plumbago, and antimony are found, and there are asphaltum and petroleum in some places. There are hot springs impregnated with alum; and buhrstone, alabaster, granite, and marble, some of the latter finely variegated. Gypsum, bismuth, brick and porcelain clay, and hydraulic limestone are found. There is bituminous coal in Mt. Diablo and the neighboring hills, and salt in several places. Very rich deposits of sulphur have been worked in one locality. One of C.'s mineral novelties is biborate of soda, or borax, found in Clear lake, the water of which is impregnated with the mineral, the borax being crystallized in the mud that forms the bottom of the lake; and near another borax lake there are a number of boiling springs, the water of which is impregnated with soda, chlorine, and boracic acid.

The state possesses some valuable advantages of climate, the leading feature being the remarkable uniformity of temperature. Comparing San Francisco with Washington, we find the mean of the year to be about the same; but the summer mean is 60° in San Francisco and 76.3° in Washington, while the winter mean is 51° in San Francisco and 36.05° in Washington. On the Pacific coast the isothermal lines run much farther n. than on the Atlantic. The line that passes through New York touches the Pacific near Vancouver island; that of Halifax, N. S., reaches n. of Sitka, in Alaska; and if we go s. down the sea-coast we find San Diego 6 or 7 degrees cooler than Charleston and Vicksburg, which are in nearly the same latitude. There are but two seasons in C., the dry, and the rainy; the winds are remarkably uniform, and in the hot months there is invariably a strong cool breeze from the ocean. Some of the valleys shut from the wind endure very high temperature, often as much as 120° in the shade; but even there at night the radiation is so intense that bed-blankets are needed. In the s.e., C. is intolerably hot; at fort Yuma the range is often above 90° day and night for weeks together; but this is an exceptional place.

The volcanic character of C. is manifested by the mountain formations, and, as in all such regions, there are occasional earthquakes. There was one in Mar., 1872, of great violence, giving one tremendous and many lesser shocks, upheaving and cracking the ground, and causing the destruction of 30 lives and a vast amount of property. In 1861, there were heavy floods in the same parts of the state, whereby property to the value of millions of dollars was destroyed. To these calamities fire added enormously, especially in San Francisco.

Agriculture in C. is dependent upon the amount of rain. If there is plenty, excellent crops are the result; if rain fails, the crops are inferior or worthless. Only a small portion of C.'s 120,000,000 acres are available for farming, and the census of 1870 returned only 6,200,000 so used. Sowing is done in Nov., and June and July are harvest months. Machinery is largely employed in agriculture. Fruits are important and abundant. Grapes and wines from C. are always in the eastern markets. As early as 1861, a million gallons of wine were made in C. (see AMERICAN WINES). Apples, pears, plums, apricots, oranges, lemons, figs, pomegranates, olives, and almonds are raised. Cotton and the sugar-beet grow well. Wool-growing is a large industry, the hilly parts of the state being well adapted to the raising of sheep, which need neither fodder nor shelter, even in winter. C. had, '83, 100,000 acres of vineyards.

C. is not remarkable for manufacturing industries, though they are increasing. Flour and grist mills and lumber-mills are in great number. Boots and shoes, cigars, wagons, woolen goods, gunpowder, tanneries, chemicals, and iron may be mentioned. The branch mint in San Francisco turns out a large coinage.

The heterogeneousness of the population of C. is noticeable. The gold excitement brought people from the ends of the earth, and every slumbering clime awoke and sent onward her legions. Of 560,247 inhabitants in 1870, 209,848 were born in the following countries: Africa, 48; Asia (not including China and Japan), 56; Atlantic islands, 943; Australia, 1593; Austria, 1078; Belgium, 291; Bohemia, 90; British America, 10,670; Central America, 126; China, 48,826; Cuba, 45; Denmark, 1837; France, 8068; Germany, 29,701; England, 17,699; Ireland, 54,421; Scotland, 4949; Wales, 1517 (total of British subjects, 90,926); Greece, 97; Greenland, 1; Holland, 472; Italy, 4660; Japan, 33; Luxembourg, 11; Mexico (the native Californians were naturalized by the treaty), 9339; Norway, 1000; Pacific islands, 93; Poland, 804; Portugal, 2508; Russia, 540; Sandwich islands, 278; South America, 1956; Spain, 405; Sweden, 1944; Switzerland, 2927; Turkey, 17; West Indies (except Cuba), 350; at sea, 142. Every one of the United States and territories was represented. The largest numbers were from New York, 33,766; Illinois, 10,695; Maine, 11,261; Massachusetts, 15,334; Missouri, 16,050; Pennsylvania, 11,201; others ranging from 10,000 down to 7 for Dakota, while 23 came

from Alaska. The natives of C. were 163,653, not quite 30 per cent of all natives. Of the entire population only 26,909 were natives of the United States born of native parents, or less than 5 per cent. Males largely exceeded females, being 349,479 to 210,768. The Chinese are the cause of much annoyance to many of the people, who urge against them that they unduly cheapen labor, and that they bring demoralization; and strong efforts have been made, both by legislation and by popular violence or threat to keep them out, but without marked effect. The problem is complex and difficult; and its solution, cannot be said to have been yet reached. In 1880, there were 20,000 Chinese in San Francisco., about 8 per cent of the total population.

The chief cities and towns as respects the population, in 1880, were San Francisco, Sacramento (the state capital), Oakland (across the bay from San Francisco), Stockton, San Jose, Los Angeles, Maryville, Santa Cruz, San Diego, Vallejo, Alameda.

C. is well supplied with serial literature. At the beginning of 1881 there were 58 daily newspapers, 2 tri-weekly, 11 semi-weekly, 250 weekly, 2 semi-monthly, 32 monthly, 1 bi-monthly, and 2 quarterly publications. The state has made ample provision for education. School age is from 5 to 21; the whole number of scholars enrolled was 161,477; average attendance, 106,179; no. colored scholars, 818; teachers of common schools, 3556; school fund, $2,011,800; income, $3,525,527; expenses, $3,031,034; value of school property, $6,949,983. There is a state normal school at San Jose, having, at last report, 90 students. In 1879, there were 13 colleges, viz.: Sacred Heart, St. Ignatius, and St. Mary's, all in San Francisco, and Our Lady of Guadalupe, at Santa Inez (all Roman Catholic); C. college, at Vacaville (Baptist); Hesperian, at Woodlawn, and Pierce Christian, at College City (both "Christian"); Pacific Methodist, at Santa Rosa (Methodist Episcopal, South); university of the Pacific, at Santa Clara (Methodist); St. Augustine, at Benicia (Protestant Episcopal); the university of C., at Berkeley, and the university, at Washington (both non-sectarian). The Pacific theological seminary (Congregational) and the San Francisco theological seminary (Presbyterian) are at Oakland. Medical education is provided for by the C. college of pharmacy, a medical department of the university of C., and the medical college of the Pacific, all in San Francisco. The university has also a law department. In the 13 colleges there were 199 instructors and 3187 students; in the theological seminaries, 7 instructors and 15 students of collegiate grade; in medicine, 26 instructors and 90 students; and in law, 3 instructors and 103 students. A special course of three years is provided for young women by the Pacific (Methodist) college, and women are admitted to all, except the Roman Catholic colleges.

The railroads in California at the beginning of 1884, and the number of miles within the state, were: Amadon Branch, 27.20; Bay and Coast S. P. C., 24.10; Berkeley Branch, 3.84; Black Diamond, 6; Bodie, 39; Bodie narrow gauge, 6; California Northern, 26.50; California Pacific, 113.44; California Southern, 129.75; Carson and Colorado, 107.50; Casper Creek, 3.25; Central Pacific, 611.77; California and Oregon, 20; Empire, 5.50; Guallala, 7; Los Angeles and Independent, 16.83; Los Angeles and San Diego (S.P.), 27.82; Mendocino, 4; Monterey, 15.12; Nevada County, 22.64; Nevada and Oregon, 3; Northern Pacific Coast, 76.25; Northern Central Pacific, 153.63; Noyo and Pudding, 2; Pacific Coast, 63.80; Pittsburg, 5.33; Redwood, 4.25; Sacramento and Placerville, 47.41; Salmon Creek, 8; San Francisco and Northern Pacific, 92.50; San Pablo and Tulare, 46.52; San Rafael and San Quentin, 3.50; San Joaquin and Sierra Nevada, 30.30; Santa Cruz, 21.20; Santa Cruz and Felton, 5.90; Sonoma Valley, 15; South Bay, 4.50; Southern Pacific, 956.66; South Pacific Coast, 45.30; Stockton and Copperopolis, 44.66; Vaca Valley and Clear Lake, 29.00; Visalia, 7.33.

The organic law of C. is very similar to that of New York and other old states. The constitution, which was adopted Nov. 13, 1849, put the then residents on the same standing as native-born citizens with regard to property. Public debts exceeding $300,000 at one time cannot be incurred unless approved by popular vote. Voters are white male citizens, 21 years old, resident six months in the state, and 30 days in the voting district. (The 15th amendment to the federal constitution makes colored citizens also voters, but the Chinese are not permitted to vote.) Elections are biennial, on the first Tuesday in September; but judges and the superintendent of public instruction are voted for at special elections in October. A plurality is sufficient to elect. The assembly has 80, and the senate 40 members, who are paid $10 per day for sessions limited to 120 days, and $3 for every 20 m. of travel. The legislature meets biennially at Sacramento. The chief executive officers and annual salaries are: Governor, $7000; lieutenant-governor, $12 per day during the session of the legislature, and $10 per day as warden of the state prison; secretary of state, $4000; treasurer, $4000; controller, $4000; superintendent of public instruction, $3000; adjutant-general, $4000; and surveyor-general, $3000. A chief justice and four associate justices of the supreme court are chosen for terms of ten years, having salaries of $6000. The governor's veto may be overcome by a two-thirds vote in the legislature. There are county courts, each with a single judge, who also acts as surrogate, except in San Francisco. The wife is secured in both real and personal property had before or acquired after marriage. The earnings of both wife and husband are common property, but the wife's earnings are not liable for the husband's debts. If a wife be separated from her husband, her earnings and those of her minor

children are her own; she may sue and be sued alone, and, by leave of a court, convey alone; and a married woman can dispose of her separate estate by will. Homesteads to the value of $5000 for the head of a family, and $1000 for a single person, are exempt from levy. Insolvent debtors, resident and non-resident, can be discharged from debts upon making assignment of all their property, and publishing notice thereof. The more important penalties are: For treason, and murder in the first degree, death; murder in the second degree, and robbery from the person, 10 years to life imprisonment; manslaughter, 10 years or less; killing in a duel, 7 years or less; mayhem, 14 years or less; rape, from 5 years to life; forgery and perjury, 14 years or less. Chinese and Indians cannot testify in court against white persons, and special taxes are imposed to restrict immigration from China (but this is believed to be illegal under our treaties with China). Any rate of interest agreed upon is lawful. Open accounts are outlawed in two years; notes in four, and judgments in five, years.

This constitution was in force until 1879. In that year (Mar. 3) a state convention, which had been in session 157 days, reported a new constitution, in which there were many novel propositions and radical changes from the old organic law. The new constitution was vigorously opposed, but in the vote taken May 7 there were 77,959 in favor and 67,134 opposed, showing an affirmative majority of 10,825. The main provisions of the new constitution are the following: Trial by jury may be waived, by consent of parties, in criminal cases not amounting to felony; and in civil cases as may be prescribed by law. In civil actions and misdemeanors juries may consist of 12, or less, as parties may agree; and three fourths of a jury may decide a verdict in civil actions. No native of China, no idiot, insane person, or person convicted of infamous crime, and no person hereafter convicted of embezzlement or misappropriation of public money, may vote. After 1880, legislative sessions begin on the first Monday after Jan. 1, and are biennial. Senators (40) hold 4 years, assemblymen (80) 2 years; legislative elections are held on the Tuesday following the first Monday in Nov. Pay of members continues only 60 days; no bill can be presented after 50 days of the session have gone by except on consent of two thirds. In appropriation bills the governor may veto or approve special items. Persons holding United States offices, except post-masters who have less than $500 salary, cannot hold offices of honor or profit in the state. No one convicted of embezzlement or defalcation of public money of the union or of any state, county, or town, is eligible for office in California. No money shall ever be taken from the state treasury for the benefit of any institution not under the state's entire control; but the legislature may grant aid to orphans, abandoned children, and aged poor. Laws shall be passed to prohibit lotteries, gift enterprises, and anything in the nature of a lottery; also, to regulate or prohibit speculative sales of stock; and all contracts for future delivery of stock are void. In elections by the legislature the members shall vote *viva voce*. Every description of direct or indirect appropriation or gift of property for the benefit of any sect is forbidden, not only to the legislature, but to the counties, cities, towns, school districts, and corporations. The public credit shall not be given or loaned in aid of any person, association, or corporation; nor shall the state or any political division thereof subscribe for stock or become an owner in any corporation. Extra compensation to public officers, agents, contractors, etc., is positively forbidden. Laws shall be enacted regulating charges for gas, telegraphing, and storage and wharfage. Bribery of a member of the legislature and lobbying with that purpose are declared felony; members proved guilty of receiving bribes are disfranchised and can never hold offices of honor or trust. Witnesses in examinations for bribery shall be compelled to testify. The governor's term is four years, salary $6000; other state officers $3000. The legislature may reduce but cannot increase these sums. Fees are abolished so far as these officers are concerned. A governor is ineligible for U. S. senator during his term of office. Among the judiciary provisions it is provided that after July 1, 1880, no judge of superior or supreme court shall receive salary unless he swear that no cause in his court submitted ninety days previous remains undecided. Appropriations to sectarian schools are prohibited. Counties, towns, and cities can incur debt only by the consent of two thirds of the voters at special elections. Cities and towns have power to regulate the price of water and artificial light. A stockholder in a corporation is liable to the amount of his shares for debts incurred while he is an owner. Directors and trustees are liable to stockholders and creditors for money embezzled or misappropriated. The acceptance of passes from railroads or other transportation companies by members of the legislature, or by public officers except railroad commissioners, works a forfeiture of office. Lands and improvements thereon shall be separately assessed. Cultivated and uncultivated lands of the same kind and situation shall be assessed at equal values. Tax-payers shall make return under oath of their real and personal property, and provision may be made for payment of real estate taxes by installments. Income taxes may be assessed and collected. There is a poll tax of $2 on each male inhabitant over 21 and under 60 for the benefit of the school fund. Except in case of war, invasion, or insurrection, the legislature shall not create a debt of over $300,000 unless for some specific object, and then provision for payment within 20 years shall be made; and such special debts shall be voted upon by the people.

The famous Chinese provisions are as follows: *Sec.* 1. The legislature shall prescribe all necessary regulations for the protection of the state, and the counties, cities, and

towns thereof, from the burdens and evils arising from the presence of aliens who are or may become vagrants, paupers, mendicants, criminals, or invalids afflicted with contagious or infectious diseases, and from aliens otherwise dangerous or detrimental to the well being or peace of the state; and shall impose conditions upon which such persons may reside in the state, and provide the means and mode of their removal from the state upon failure or refusal to comply with such conditions; provided, that nothing contained in this section shall be construed to impair or limit the power of the legislature to pass such police laws or other regulations as it may deem necessary.

Sec. 2. No corporation now existing or hereafter formed under the laws of this state shall, after the adoption of this constitution, employ, directly or indirectly, in any capacity, any Chinese or Mongolian. The legislature shall pass such laws as may be necessary to enforce this regulation.

Sec. 3. No Chinese shall be employed on any state, county, municipal, or other public work, except in punishment for crime.

Sec. 4. The presence of foreigners ineligible to become citizens of the United States is declared to be dangerous to the well being of the state, and the legislature shall discourage their immigration by all the means within its power. Asiatic coolyism is a form of human slavery, and is forever prohibited in this state, and all contracts for cooly labor shall be void. All companies or corporations, whether formed in this country or any foreign country, for the importation of such labor, shall be subject to such penalties as the legislature may prescribe. The legislature shall delegate all necessary power to the incorporated cities and towns of this state, for the removal of Chinese without the limits of such cities and towns, or for their location within prescribed portions of those limits; also, it shall provide necessary legislation to prohibit the introduction into this state of Chinese after the adoption of this constitution.

Principals and seconds in duelling or challenging to a duel are disfranchised, and cannot again hold office. The property of husband and wife shall belong separately to each. The suffrage shall be protected by adequate laws. Mechanics and laborers have property liens for the value of labor and material furnished. Eight hours is a day's work. No person shall, on account of sex, be disqualified from entering upon or pursuing any lawful business, vocation, or profession. There are no more judicial districts; every county elects a superior judge (San Francisco elects 12, six others elect two each). Three railroad districts were created, and the congressional districts were newly arranged.

At the time the vote was taken on this constitution, for and against which 145,212 votes were cast, there were 154,638 votes against Chinese immigration. But all the enactments on that subject fall to the ground, since they are in conflict with the treaty with China, and the federal constitution provides that treaties shall be the supreme law of the land.

The first votes of California (4) for president were cast in 1852 for Pierce and King; in 1856, for Buchanan and Breckinridge; in 1860, for Lincoln and Hamlin; in 1864 (5 votes), Lincoln and Johnson; in 1868, Grant and Colfax; in 1872 (6 votes), Grant and Wilson; in 1876, Hayes and Wheeler; 1880 (5 votes), Hancock and English; 1884 (8 votes), Blaine and Logan. Pop. of state, '80, 864,694—292,874 foreign.

CALIFORNIA, Gulf of, an arm of the Pacific ocean, which divides the peninsula above described from the rest of Mexico. It was originally known as the sea of Cortez, having been discovered under his auspices, and explored by himself; and it has, from its shape, been occasionally designated the Adriatic of the new world. It is 700 m. in length, and varies in width from 40 to 100 miles. At its northern extremity, it almost touches the territory of the United States, receiving therefrom the united streams of the Gila and the Colorado. The gulf contains many islands, particularly towards its head, and has long had a pearl-fishery. At the e. side of its entrance stands Mazatlan, on a river of the same name, now the most frequented port of the neighboring regions.

CALIFORNIA, University of, established in 1868 as a non-sectarian institution, an outgrowth of the college of California. The university is at Berkeley, 4 m. n. of Oakland, and occupies two buildings. In 1884, it had 55 professors and instructors, and 155 students of college grade, under the presidency of William T. Reid. The students are enrolled in separate colleges, in each of which they may pursue a regular or a special course. The college of letters maintains two courses: the regular classical, which leads to the degree of bachelor of arts, and the literary course, which leads to the degree of bachelor of philosophy. In both courses a liberal amount of time is bestowed upon the principles of modern science. All the colleges are in successful operation, including the college of letters, five colleges of science, and three professional colleges of law, medicine, and pharmacy, under regular faculties. Students of both sexes are admitted on equal terms. The university is entitled to the avails of the public lands given to the state for an agricultural college by the act of congress of 1862. Lick observatory, at Mt. Hamilton, is connected with the University.

CALIG'ULA, Caius Cæsar Augustus Germanicus, Roman emperor (37–41 A.D.), the youngest son of Germanicus (nephew of Tiberius) by Agrippina, was b. 31st Aug., 12 A.D., at Antium, and was educated in the camp, where the soldiers gave him the by-name C., from the half-boots (*caligæ*) which he wore. On the death of his brother

Drusus, he was made augur in his stead; and on the death of Tiberius (37 A.D.), who, it was suspected, had received foul-play at his hands, it was found that he had been appointed co-heir along with the grandson of Tiberius, but the senate and the people allowed C. supreme and sole authority. In the beginning of his reign, he appeared hardly likely to fulfill the threat of Tiberius, who had talked of educating C. "for the destruction of the Roman people." He was, to appearance, lavishly generous and merciful, pardoning even those who had been the instruments of cruelty against his own family. But this ostentatious magnanimity was itself a disease, an unwholesome affectation, founded on no principle, or even humanity of heart, and co-existed with the most savage voluptuousness and lust. Consequently, when illness, the result of his vicious life, had weakened his faculties, the lower qualities of his nature obtained the complete mastery. In addition to the senseless prodigality with which he commenced his career—expending in one year the enormous wealth left by Tiberius (720 millions of sesterces)—he began to manifest the most barbarous propensities. He banished or murdered his relatives, excepting his uncle Claudius and sister Drusilla (with whom he carried on incestuous intercourse); filled Rome with executions, confiscating the estates of his victims; amused himself, while dining, by having victims tortured and slain in his presence; and uttered the wish "that all the Roman people had but one neck, so that he might decapitate Rome at a blow!" To vie with Xerxes, he made a bridge of ships over the bay between Baiæ and Puteoli (a distance of three Roman miles and 600 paces), and celebrated the exploit by a costly banquet on the middle of the bridge, and by collecting on it great numbers of people, and causing them to be drowned. His favorite horse was stabled in a palace, fed at a marble manger with gilded oats, was made a member of the college of priests, and afterwards raised to the consulship. As a climax to all his absurdities, he declared himself a god, and had temples erected, and sacrifices offered to himself. To gratify his monstrous desires, he shrunk from no infamy; he robbed, plundered, and taxed his subjects to a degree which seems almost incredible, and when even these means proved insufficient, he established a brothel in his own palace, and sent out his slaves to solicit the public patronage for it. At length a conspiracy was formed against him, and he was assassinated 41 A.D.

CA'LIPH (Turk., a successor), the title of Mohammed's successors in temporal and spiritual power, from which the historians of the middle ages designated the Arab empire founded by these princes the CALIPHATE. This empire, for two or three centuries, exceeded even the Roman empire in extent. As Mohammed died without leaving any sons, a contest arose concerning the inheritance of his power, which terminated (632 A.D.) in the triumph of Abubekr (q.v.), one of his fathers-in-law, over Ali, his nephew and son-in-law. Abubekr now assumed the title of Caliphet-Resul-Allah—i.e., representative or deputy of the prophet of God. He sent forth his armies for the extension of Mohammedanism, and after several victories over the forces of the Byzantine empire, conquered Syria. He was succeeded in 634 by Omar, another father-in-law of Mohammed, by whom Egypt and Jerusalem were annexed to the caliphate. He assumed the title of Emir-al-Mumenin—i.e., prince of the faithful—a title which all subsequent caliphs retained. Othman, a son-in-law of the prophet, was the third C., and was elected by six persons appointed by Omar before his death. During his reign (644–56 A.D.), the Arabian empire grew with extraordinary rapidity, being extended into Persia, and westward along the n. coast of Africa as far as Ceuta. The Byzantine emperors recovered Egypt; but it was wrested from them again at a prodigious expense of blood. The people of Medina elected Ali-ben-Abi-Taleb as C. upon the death of Othman. The Shiites regard him as the first true imam or high-priest, and honor him and his son Hassan almost equally with Mohammed himself. Contests against rivals prevented him from doing much for the extension of the caliphate. Moawijah, the governor of Damascus, having made himself really independent during Ali's life, and having extended his power over Syria, Egypt, and part of Arabia, became C. in 661, and founded the dynasty of the Ommiades, making the caliphate hereditary. He removed the seat of the caliphate to Damascus. His armies ravaged Asia Minor, and laid siege to Constantinople, but could not take it. He made important conquests, however, in Central Asia. The caliphate did not remain long in the family of Moawijah, and it frequently happened that in one or other of the subject countries a governor raised himself to a temporary independence; and rival caliphs frequently contended for power. Abdalmelek (685–705 A.D.) united all the Moslems under his dominion. Under his son, Walid I., the caliphate reached its zenith of prosperity, the Arabs conquering Turkestan in 707, Galatia in 710, and Spain in 711. Under Hesham, the progress of the Arabs in the west was arrested by Charles Martel at Tours (732 A.D.), and at Narbonne (736 A.D.). The dynasty of the Ommiades in Asia terminated with Merwan II. in 752, giving place to that of the Abbasides. But a branch of the Ommiades founded an independent caliphate at Cordova, and another founded one in Arabia, which subsisted till the 16th century. Abul-Abbas (750–54 A.D.), the first Abbaside C., signalized himself by his cruelty and the torrents of human blood which he shed. His successor, Abu-Jafar, called Al-Mansur, a patron of the arts, but a persecutor of Christians, founded Bagdad (q.v.), and removed the seat of the caliphate thither. From the beginning of the 9th c., the Arab empire, which had suffered much from corruption and internal disorganization

under the last caliphs of the Ommiade dynasty, and had never completely recovered, showed increased signs of decay. Even under the C. Harun-al-Raschid, whose praises the eastern poets were accustomed so much to celebrate, independent kingdoms were established (800 A.D.) by the Aghlabides in Tunis, and the Edrisides in Fez. In 821, Taher, the governor of Khorassan, made himself independent, and established a dynasty there, and other governors of provinces followed his example. But under the C. Al-Mamun, the Arabians conquered Sicily and Sardinia, the former of which they held till it was taken from them in 1035 by the Normans; and the latter, till it was conquered by the Pisans in 1051. The C. Motassem (833–42 A.D.) was the first to employ Turkish soldiers; but the practice was followed by his successors; and the Turkish body-guard soon became a formidable power in the caliphate, and about the middle of the 9th c. assumed the right of deciding the succession to the throne. Many of the caliphs, meanwhile, were base voluptuaries, and of the others, some were of little capacity, and their power rapidly declined. Ere the middle of the 10th c., the caliphs themselves exercised a mere nominal sovereignty, whilst the emirs, like the mayors of the palace towards the close of the Merovingian dynasty among the Franks, possessed all real power. The princes of the Fatimide dynasty, which succeeded that of the Aghlabides in Tunis, having made themselves masters of Egypt in 970, assumed the title of C., so that there were now three caliphates—at Bagdad, at Cairo, and at Cordova. In the 11th c., the caliphs of Bagdad were still acknowledged as the spiritual chiefs of all the Moslems; but their temporal power scarcely extended beyond the walls of Bagdad. Bagdad itself became the prey of a Mongol horde in 1258, and the representative of the caliphs fled to Egypt, where, under the protection of the Mamelukes, who had made themselves masters of that country in 1250, he retained his title and spiritual power, which he transmitted to his successors, who continued to reside there till the Turks conquered Egypt in 1517, when the last of them was carried to Constantinople; and since that time the Turkish sultans have assumed the title of C., and claimed to be regarded as the spiritual chiefs of all the Moslems, a claim to which little respect has ever been paid except within the limits of their own empire.

CALIPPIC CYCLE. See PERIOD.

CALIPPUS, or CALLIPPUS, an astronomer of Greece, in the 4th c., B.C. He corrected earlier measurements of time by Meton's cycle of 19 years, which he found to be six hours too long. He made the year 365¼ days.

CALISTHEN'ICS, physical exercise designed to promote strength and proper bodily development. The usual apparatus includes a pair of light dumb-bells, Indian clubs, stout wooden rings, a wooden staff about 4 ft. long, horizontal bars, bags of beans for throwing and catching, and two weights running upon vertical cords. The practice of calisthenics is growing among schools for girls.

CALI'TRI, a t. of Italy, in the province of Avellino, near the Ofanto, and about 7 m. e.n.e. of Conza. It has a pop. of 6200, who are chiefly engaged in agricultural pursuits. Sheep are reared to a considerable extent in the vicinity.

CAL'IVER was a matchlock or fire-arm about midway in size and character between an arquebuse and a musket; it was small enough to be fired without a rest or support.

CALIX'TINES, a Bohemian religious sect, so named from the Latin *calix*, a cup, because they contended for giving the cup, as well as the consecrated wafer, to the laity. Their confession of faith (1421) contained the following articles: 1. That the word of God ought to be freely and regularly preached by the priests of the Lord throughout Bohemia; 2. That the eucharist in both kinds ought to be administered to all burdened with "no mortal sins," according to the language and command of the Saviour; 3. That the clergy should separate themselves from secular affairs; 4. That all "mortal sins," and especially public ones, such as debauchery and simony, and any other disorders contrary to the law of God, should be prevented or punished by those who were the lawful authorities in such matters. In other main points they were moderate followers of John Huss, and were opposed to the more extreme sect of Taborites (q.v.). Their peculiar articles of faith were conceded by order of the council at Basel (1433); and having prevailed over the Taborites in the conflict which took place at Bochmischbrod, 30th May, 1434, they became the dominant party in Bohemia, and exercised considerable influence over political affairs. Gradually, however, the C. lapsed from the severity of their four articles, while the schism of the energetic Taborites, and later of the Bohemian brethren (q.v.), rendered them completely powerless. At the beginning of the 16th c., they had ceased to possess any importance, and only served to prepare the way for Protestantism.

CALIX'TUS, a name borne by three popes. The first was born a slave, and is said to have suffered martyrdom, 223 A.D. The second (d. 1124) was a son of the count of Burgundy, and a ruler of firmness. He expelled the anti-pope Gregory from Rome in 1120, stormed the castle in which he took refuge, and made him a prisoner. He also concluded the concordat with Henry V., of Germany, at Worms; broke the power of the Cenci family, and demolished their castles. The third was of the Spanish Borgia family, and his leading idea was to institute a great crusade against the Turks, in which he failed. He died in 1458, and was succeeded by Alexander VI., one of the most notorious of the Borgia family.

CALIXTUS, Georg (properly, *Callisen*), an eminent theologian of the Lutheran church, was born 14th Dec., 1586, at Medelbye in Schleswig; studied at Flensborg and Helmstedt; and, in 1605, became professor of philosophy in the latter of these cities. Two years after, he betook himself to theology, and attracted great attention by the breadth and originality of his views. After traveling for some time in Germany, Holland, England, and France, where he made the acquaintance of the most learned men of his time, he returned to Helmstedt in 1613, and was appointed professor of theology. His genius, the depth of his knowledge, and his large experience of the world and of men, which he had acquired in his travels, developed in him a spirit of great tolerance towards all who held their religious opinions honestly, whatever these might be. Although his dissertations on the Holy Scripture, transubstantiation, communion in one kind, etc., are acknowledged by learned Catholics to be about the most solid and admirable which have been composed by Protestants against the distinctive doctrines of Catholicism, he was, on account of some statements in his work, entitled *De Præcipuis Religionis Christianæ Capitibus* (Helmstedt, 1613), which seemed favorable to Catholic dogmas, and of others in his *Epitome Theologiæ Moralis* (Helmstedt, 1634), *De Tolerantia Reformatorum*, etc. (Helmstedt, 1658), which approached too near to the Reformed or Calvinistic standpoint, declared guilty of abominable heresy by the adherents of the letter of the Concordienformel—i.e., the orthodox and dogmatically rigid Lutherans. C. felt keenly that the polemical harshness of Lutheranism was a serious obstacle in the way of a great Catholic Christianity, and that Protestantism must assume another form before it could hope to become the religion of Europe. Under this conviction, B. endeavored to show that the oldest and most fundamental articles of the Christian faith—viz., the facts embodied in the "Apostles' Creed"—were common to all Christian sects. In subsequent dissertations, having stated that the doctrine of the Trinity was less distinctly taught in the Old than in the New Testament, and that good works were necessary to salvation; and finally, at the religious conference of Thorn, in 1649, whither he was sent as a mediator by the elector of Brandenburg, having been on more intimate terms with the Calvinistic than the Lutheran theologians, C. was accused of apostasy. Fortunately, however, he had powerful friends, who stood firmly by him, and through their help he was enabled to retain his professorial chair till his death, on 19th Mar., 1656.

CALKINS, William H. See page 886.

CALL, Wilkinson. See page 886.

CALL, a term often used in reference to various theological and ecclesiastical subjects. —1. The command or invitation to believe in Jesus Christ, is designated the *call of God*, or the *gospel call*. Calvinistic theologians make a distinction between a *general* call and a *special* or *effectual* call. The former is addressed, they say, to all to whom the word of God comes; but it is insufficient of itself to induce any man to the act of faith, and requires, in order to its efficacy, that it be accompanied by the special and irresistible grace of the Holy Spirit. They are careful, however, to state that the general or outward calling by the word always precedes and accompanies the special and effectual calling by the Spirit. The notion of an inward call by the Spirit of God in the soul, unconnected with outward calling by the word, belongs not to Calvinistic, but to mystic theology.—2. A call to office in the church, and particularly to the ministry of the gospel, is regarded by Christians generally as proceeding from God; and the church of England requires of candidates for ordination an express profession that they trust they are so moved of the Holy Ghost.—3. A call by the people who are to be under the pastoral care of a minister has been generally regarded in the Christian church as necessary to the establishment of the pastoral relation. But there have been great differences of opinion as to what constitutes a sufficient call, and great differences of practice with regard to it. Some of the principal ecclesiastical dissensions in Scotland have had their origin in this question. The election of a pastor by the *Christian people* of his *parish* or *congregation*, has been contended for by many as the true call, or the best kind of it; others, approving of patronage with certain limitations, contended no less earnestly for the right of the people to be consulted, so that without their concurring by a call, the patron's presentee should not be held entitled to be inducted into the pastoral office; and according to the practice of the church of Scotland, this concurrence was always at least formally sought. Questions concerning the call and its proper value, supposed to have been determined by the earl of Aberdeen's act, passed when the *disruption* of the church of Scotland took place in 1843, were not finally settled until the passing of the act for the abolition of patronage (1874), which gives the right of calling to the congregation. See Scotland, Church of; Free Church of Scotland; and Patronage.

CALL, a stipulated sum to be paid towards a share in a joint-stock undertaking. For example, in a £10 share, there are usually at least four calls of £2 10*s*. each, the calls being made at intervals of not less than three months.

CALL, a military musical term meaning a signal on the trumpet.

CALL is a metal whistle used by the boatswain and his mate on shipboard. Various strains or kinds of sound produced denote signals or orders for hoisting, heaving, lowering, veering, belaying, letting-go, etc. These sounds are as much attended to by seamen, as those of the drum, bugle, and trumpet are by soldiers. At one time, a gold call, with a chain, used to be the badge of an admiral.

CALLA, a genus of plants of the natural order *araceæ*, or, according to some botanists, of the natural order *orontiaceæ*, which is distinguished from *araceæ* only by having

hermaphrodite flowers. The genus *calla* is characterized by a flat spathe (q.v.), within which is a cylindrical spadix (see SPATHE) covered with naked flowers, appearing as a mere mixture of stamens and pistils, and a one-celled ovary with 6 to 8 erect ovules. The known species are few, and natives of very different climates. *C. palustris* is found in swamps in Europe, Siberia, and North America, but not in Britain. It has a creeping root-stock, and heart-shaped, stalked leaves, the midrib of which is prolonged beyond the blade into a point; the spathe is white, and the spadix yellow. The root-stock is extremely acrid and caustic; but being deprived of its acridity by grinding, boiling, and macerating, is made by the Laplanders into a kind of bread called *missebroed*, which they hold in high estimation.—The well-known and beautiful *Richardia Ethiopica* was formerly included in this genus, and is often still called calla.

CALLAHAN, a co. in n.w. Texas, not settled; 900 sq. miles. It has a rocky and broken surface, with little timber, but good for grazing. Pop. '80, 3453—34 colored.

CAL'LANDER, a village in Perthshire, on the left bank of the Teith, 16 m. n.w. of Stirling. It lies in a beautiful and romantic situation, surrounded by high mountains and Highland lakes. Hence it is much frequented by tourists, who make this place a center to visit Benledi, the Trosachs, the Bracklin falls, and Lochs Lubnaig, Vennachar, Achray, and Katrine. Pop. '71, 1870.

CALLANDS, VA. See page 886.

CALLAO, the port of Lima, the capital of Peru, connected with that city by a railway of 6 m. in length. It stands in lat. 12° s., and long. 77° 13′ w. Fine harbor-works, with extensive pier and dock accommodation, were completed in 1875. The roadstead is large, free from rocks, and safe, being sheltered by the island of San Lorenzo. The exports are guano, specie, copper, cotton, bark, and hides. The value of exports and imports is about £6,000,000 annually. C. contains about 33,000 inhabitants. The present C. dates only from 1746, when the original city was submerged and destroyed by an earthquake.

CALLAWAY, a co. in s.w. Kentucky, on Tennessee river; 450 sq.m.; pop. '70, 9410—812 colored; in '80, 13,333. The surface is varied, and soil fertile, producing corn, tobacco, etc. Co seat, Murray.

CALLAWAY, a co. in e. Missouri, on the Missouri river; 743 sq.m.; pop. '80, 23,670—4402 colored. The soil is mainly prairie, and fertile, producing corn, tobacco, potatoes, butter, wool, etc. Co. seat, Fulton.

CALL TO THE BAR is the formal expression by which the admission of law-students to the rights and privileges of the degree of barrister in England and Ireland is publicly announced. In Scotland the corresponding expression is *Passing Advocate*. See BARRISTER; INNS OF COURT; and ADVOCATES, FACULTY OF.

CALLCOTT, Sir AUGUSTUS. This name has been erroneously spelled CALCOTT (q.v.).

CALLCOTT, JOHN WALL. See CALCOTT.

CALLE'JA, Don FELIX DEL REY, 1750–1820; count of Calderon, commanding the Spanish forces in Mexico during the Hidalgo insurrection. In Jan., 1812, he captured the fortress of Zitacuaro and murdered all the inhabitants; and in the same year he captured Hidalgo's successor, the priest Morelos, who was at once shot. For these acts he was made viceroy and ennobled.

CALLERNISH, a district on the w. coast of the island of Lewis, about 16 m. from Stornoway, remarkable for its circles of standing stones (q.v.). There are four circles, at no great distance from one another, but without any visible relation. The principal one, is of a more than usually elaborate design. "A double line of upright stones run parallel to each other in a northerly direction, while a single line of similar stones is projected from the s., e., and w. points, thus giving a cruciform figure to the structure. A stone of larger dimensions than any of the others occupies the center of the circle, and completes the whole. . . . . That the position was chosen and laid down from astronomical observation, can easily be demonstrated by visiting the spot on a clear night, when it will be found that by bringing the upper part of the single line of stones extending to the south to bear upon the top of the large stone in the center of the circle, the apex of that stone coincides exactly with the pole-star. . . . . The stones themselves are not columnar, or shaped into any form; they are simply broad, flat blocks of gneiss—the all-prevailing rock from the Butt of the Lewis to Barra Head. The following are their dimensions: diameter of circle, about 40 ft.; length of west line, 43 ft.; length of east line, 38 ft.; length of south line, 69 ft.; length of avenue, 270 ft.; breadth of avenue, 27 ft.; average height of stones, 6 to 8 ft.; height of center stone, 12 feet. There are 13 stones in the circle, including the center one, 19 in the avenue, 5 in each of the east and west, and 6 in the south arm. The measurements of height are taken from the present level; but it must be borne in mind that there is a bed of peat-moss, 4 or 5 ft. thick, through which the stones rise from the clay beneath; this gives a height of 16 to 17 ft. to the center stone, and from 10 to 13 ft. to the others, exclusive of the foundation."—*Notice of the Stone Circle at Callernish*, communicated to the society of antiquaries of Scotland, by Mr. Henry Callender, Mar., 1857.

CALL OF THE HOUSE is an imperative summons to every member of parliament of either house on some particular occasion, when the sense of the whole house is deemed

necessary. In the *house of lords*, when any urgent business is deemed to require the attendance of the lords, it has been usual to order the house to be called over; and this order has sometimes been enforced by fines and imprisonment upon absent lords. On some occasions, the lord chancellor has addressed letters to all the peers, desiring their attendance, as on the illness of George III., 1st Nov., 1810. The most important occasion on which the house was called over, in modern times, was in 1820, for the trial of queen Caroline.

When the *house of commons* is ordered to be called over, it is usual to name a day which will enable the members to attend from all parts of the country. The interval between the order and the call has varied from one day to six weeks. If it be really intended to enforce the call, not less than a week or ten days should intervene between the order and the day named for the call. The order for the house to be called over is always accompanied by a resolution "that such members as shall not then attend, be sent for, in custody of the sergeant-at-arms." And it was formerly the custom to desire the speaker to write to all the sheriffs to summon the members to attend. On the day appointed for the call, the order of the day is read and proceeded with, postponed, or discharged, at the pleasure of the house. If proceeded with, the names are called over, according to the counties, which are arranged alphabetically. The members of a county are called first, and then the members for every city or borough within that county. The counties in England and Wales are called first, and those of Scotland and Ireland in their order. This point is mentioned, because it makes a material difference in the time at which a member is required to be in his place.—See May's *Proceed. in Parl., on Attendance of Members.*

CALLICHTHYS (Gr. *kalos*, beautiful, *ichthys*, a fish), a genus of fishes of the family *siluridæ* (q.v.), having the body almost entirely covered by four rows of large, hard, narrow, scaly plates, two rows on each side. The head is also protected by a sort of helmet. The mouth is small, the teeth very small; two long barbules hang from each angle of the mouth. The species of this genus are natives of warm climates, particularly of South America. They are interesting because, when the streams or pools which they inhabit dry up, they make their way across the land to some other piece of water, even although at a considerable distance. They also sometimes bury themselves in the mud of wet meadows, out of which they are digged. They have no special organs for carrying a supply of water with them, like the climbing perch, but are supposed to retain a little between the plates of their body. A still more interesting part of the natural history of these fishes is their making regular nests, generally of leaves, in which they deposit their eggs, near the margin of the water, at the beginning of the rainy season, the male and female uniting in watching them until they are hatched. These habits are shared by the species of the allied genus *doras*, in which the lateral plates are broader, keeled, and each ending in a spine.

CALLIC'RATES, a Greek architect in the 5th c. B.C., who, assisted by Ictinus, was the builder of the Parthenon.

CALLICRAT'IDAS, the successor of Lysander in command of the Lacedemonian fleet against the Athenians, 406 B.C. After two successful battles he was defeated in a third, thrown overboard, and drowned.

CALLIÈRES BONNEVUE, Louis Hector, Chevalier de, 1639–1703; a French army officer, governor of Montreal in 1684, and in 1687 leader of the advance of the forces invading the lands of the six nations in New York. He visited France to urge the seizure of the city of New York as a security for French supremacy in Canada. In 1699, he was made governor-general of Canada.

CALLIG'ONUM, a genus of plants of the natural order *polygoneæ* (q.v.), having a quadrangular fruit (*achenium*, q.v.), winged at the angles. The best known species is *C. pallasia*, a succulent shrub found on the sandy steppes near the Caspian sea, and in the lower part of the basin of the Volga, where its acid fruit and its also acid shoots often serve to allay the thirst of the Kalmucks and of weary travelers. Its root strikes deep into the sand, is swollen at its upper part, and when cut there, gives out a nutritious gum resembling tragacanth (q.v.), which is also obtained by pounding and boiling it, and on which the Kalmucks feed in times of scarcity.

CALLIM'ACHUS, an eminent poet, grammarian, and critic of the Alexandrian period, flourished about the middle of the 3d c. B.C. He was of a distinguished family at Cyrene, in Libya; taught grammar and belles-lettres in Alexandria; was a favorite of Ptolemy Philadelphus, and his successor Ptolemy Euergetes; and was made principal librarian of the Alexandrian library. He wrote many works on the most various subjects (Suidas mentions 800), but only fragments are extant; nor have we many of his poems; but the poems which we have, bear the marks of an age when the artificial had obtained a preference over the natural.

CALLIM'ACHUS, an architect and artist of Greece, who lived about 400 B.C., and is said to have been the originator of the Corinthian column.

CALLING THE DIET is the Scotch term for *arraignment* (q.v.), although the forms are different. In Scotland, excepting in cases of high treason, there is no grand jury, but the procedure is briefly as follows: Before a prisoner can be tried, a written or printed

copy of the indictment preferred against him must have been served 15 days before the trial, with a copy of the list of witnesses to be examined against him, and also of the jury panel. When, therefore, he is placed at the bar of the court, and called on to plead, he is presumed to know the nature of the charge made against him. But if it be desired by him, or by his counsel, the clerk in the first instance reads the indictment aloud in open court—the same being a well-prepared syllogistic statement of the facts, which the prosecutor is prepared to prove. He is then called upon to state his objections to the relevancy, and to have such relevancy disposed of by the court, before being called on to plead to the fact. If the judgment of the court is in favor of the objection, the prosecution for the time fails, and the prisoner is sent back to jail, to abide another indictment, unless the prosecutor chooses to abandon the case against him altogether. See INDICTMENT, VERDICT, DEFENSE.

CALLINGER, one of the hill-forts of Bundelcund (q.v.), elevated about 700 ft. above the adjacent plain, and separated from a neighboring range of mountains by a ravine of 1200 yards in width. It is in lat. 25° n., and long. 80° 32′ e., being 112 m. to the s.w. of Allahabad. From its position and size, C. must at one time have been a place of great strength. It was stormed by the British in 1812. At the s.e. base of the rock stands a town of the same name, which, though it is now much decayed, yet bears testimony to its ancient extent and grandeur. The locality is famous for its excavated temples of Siva.

CALLI'NUS OF EPHESUS, reputed to have been the earliest of the Greek poets, lived about 700 B.C. One of his elegies has been preserved to the present time.

CALLIO'NYMUS. See DRAGONET.

CALLI'OPE (i.e., the sweet-voiced), was, according to the ancients, the first of the Muses (q.v.), and presided over epic poetry, or over poetry in general. She was said to be the mother of Orpheus, of the Sirens, etc. She was usually represented with a style and wax tablets.

CALLIPERS, a kind of compasses with curved legs, used by turners and other workmen for measuring the diameters of cylindrical, spherical, and other curved work. The C. are laid over the work, and opened or closed until both points just touch the periphery; then the C. are laid upon a rule, and the extent of their opening measured, or the size is compared with a pattern.

CALLIR'HOË, a fountain near Athens, called the fountain of nine springs, because its waters were distributed in that number of channels.

CALLISTE'IA, a Grecian festival at which a prize was awarded to the most beautiful woman. But among the Elians men were the competitors, and the victor received a suit of armor which he dedicated to Minerva.

CALLIS'THENES, of Olynthus, was the son of Hero, a cousin of Aristotle. C. was b. about 360 B.C.; he was educated by Aristotle along with Alexander the great. He devoted himself to the study of natural and political history, and accompanied Alexander the great in his expedition to India. He incurred the displeasure of the courtiers and royal favorites, and of Alexander himself, who was displeased by his remonstrating against his intended assumption of divine honors, and in general by his bold, indiscreet, outspeaking ways; and he was put to death on a pretended charge of treason, 328 B.C. Only a few fragments of his historic works remain, and these are not valuable. The *History of Alexander* ascribed to him, of which there are several MSS. in the Paris library, is evidently a production of the 7th c., and rather a romance than a history.

CALLIS'TRATUS, an orator of Athens whose eloquence led Demosthenes to devote himself to public speaking. For surrendering Oropus (after a heroic defense) to the Thebans, he was condemned to death, 361 B.C., but he fled to Macedonia, where he founded the city of Datum, afterwards called Philippi. At a later period he returned to Athens and was put to death.

CAL'LITHRIX. See SAGOUIN.

CAL'LITRIS. See SANDARACH.

CALLOS'ITIES. See CORNS.

CALLOT, JACQUES, one of the most eminent artists of his time, was b. at Nancy, 1592. Proceeding to Rome, he commenced drawing and engraving under Thomassin in his eighteenth year. He next went to Florence, where, by numerous spirited etchings, he gained great fame, and engraved for Cosmo II., grand duke of Tuscany, a series of plates of court-festivals, etc. When his patron died (1621), C. returned to his native place, and increased his reputation by a copious series of etchings, including six plates of the siege of Breda. By order of Louis XIII., who invited C. to Paris, etchings of the sieges of Rochelle and the Ile Rhé were executed; but C. refused to commemorate by art the capture of his native town, and, declining the pension offered by the king, returned to Nancy, where he died, 1635. His activity as an artist was marvelous. Of his engravings, 1800 are still preserved at Dresden. As helps to a vivid conception of the manners, conditions of life, events, etc., in the 17th c., they are invaluable. C.'s "Misères de la Guerre," a series of 18 plates, are especially celebrated.

CALLU'NA. See HEATH.

CALLUS. This term was employed in old surgical works, and is still used popularly, to indicate the exuded material by which fractures of bones are consolidated together. If the broken ends are accurately adjusted to each other, there is no projection of C., but merely a slight deposition of it between the two surfaces; if, however, the adjustment is not accurate, the C. is effused in such quantity as to fill up any interspaces that may exist, and as often to form a considerable hard swelling round the seat of the fracture; any excess is, however, usually absorbed during the last stage of the repair of a fracture. When the broken ends are allowed to move upon each other—which, of course, should be always prevented, if possible—a ferule of new bone, encircling both fragments for some little distance, so as to splice them together, till they are united by a permanent C., is formed; this is termed a *provisional* callus.

CALMAR. See KALMAR, *ante.*

CALMET, AUGUSTINE, an exegetical and historical writer, and learned Benedictine, was b. at Mesnil-la-Horgue, near Commercy, Feb. 26, 1672, and, in 1689, entered the order of Benedictines. In 1698, he was appointed teacher of philosophy and theology in the abbey Moyen-Moutier; in 1704, sub-prior of a convent of learned monks at Münster, in Alsace; and in 1706, he went to Paris, to superintend the publication of his *Commentary on the Bible.* He was afterwards appointed prior at Lay (1715), abbot of St. Leopold (1718), abbot of Senones in Lorraine (1728), and died at Paris, Oct. 25, 1757. His exegetical writings have been commended and studied with advantage by both Roman Catholics and Protestants. The *Commentary on the Bible* (23 vols., Paris, 1707–16), though marked by the author's deficient knowledge of the oriental languages, contains valuable researches in biblical antiquities. C.'s *Historical and Critical Dictionary of the Bible* (4 vols., Paris, 1722–28) was translated into English, German, and other languages, and has passed through many editions. His other works—a *History of the Bible,* and of the *Jews* (1718), and a *Universal History* (1735–71)—are mere compilations; but his *History of Lorraine* is founded on original researches. Solid criticism and vigorous intellect are wanting in all his works.

CALMS, or CALM LATITUDES, are those parts of the ocean, near the equator, which are subject to total absence of wind for long periods together. The part of the ocean where C. are most looked for, is between the region of the trade-winds and that of the variable winds. See WINDS. It is almost as much dreaded by seamen as a region of storms, for the ship is unnavigable; and during a calm of many weeks, food and water may be nearly exhausted, at a point too far from land for boats to reach it. Where a calm occurs unexpectedly, it is likely to be followed by violent storms.

CALMUCKS. See KALMUCKS.

CALNE, a parliamentary borough and ancient t. of Wiltshire, on the river Marden, 31 m. n.n.w. of Salisbury. It lies in one of the many valleys of the chalk escarpment of this part of England, with the plateau of the Marlborough downs and Salisbury plain on the e. and south. In 1863, a branch line was opened to C., 6 m. from the Chippenham station of the Great Western railway. The principal industry is the curing of bacon; and there are also flax, paper, and flour mills. The manufacture of woolens, formerly of importance, is now almost extinct. There is also a weekly corn-market. Pop. of the town in 1881, 2474. The parliamentary borough, formerly returning two members to parliament, but now only one, includes part of Blackland and Calstone. Many Roman remains have been found here. The West-Saxon kings had a palace at Calne, but no traces of it now remain. At a synod held here by St. Dunstan in 977, relative to the celibacy of the clergy, the floor of the room in which the synod sat gave way, precipitating all to the ground but St. Dunstan, who presided. On an almost perpendicular declivity 3 m. e. of C. is the figure of a *horse,* 157 ft. long, in a spirited attitude. It was cut out in white chalky ground in 1780 by Dr. Allsopp, and is visible 50 m. off. Dr. Priestley resided at C. 1770–80.

CALO'EE. See BOEHMERIA.

CALOMARDE, Don FRANCISCO TADEO, Count, a Spanish statesman, was b. in 1775 at Villel, in Aragon. He studied at Saragossa, where he passed as an advocate. After the expulsion of the French, and the return of Ferdinand VII. in 1814, C. was among the first to hurry to Aragon, and do homage to him as an absolute monarch. As a reward of his obsequious celerity, he obtained the highest office in the *secretaria general de Indias,* but lost it on account of accepting a bribe. On the restoration of the constitution in 1820, he unsuccessfully courted the favor of the liberals; but when the French army in 1823 enabled the king once more to rule despotically, C. was appointed secretary of the *cámara del real patronato,* one of the most influential offices in the kingdom. Not long after, the king made him minister of justice. While he held this function, he persecuted the liberals with cold-blooded savageness, recalled the Jesuits, re-opened the monasteries, and closed the universities. He also secretly favored the party of Don Carlos; but, on the other hand, by treating any unseasonable outbreak with a strictness bordering on cruelty, he preserved himself from the suspicion of being implicated in their schemes. In 1833, when Ferdinand was supposed to be on his death-bed, he was prevailed on by C. to re-introduce the Salic law, by which Christina

was excluded from the throne, and Don Carlos, the favorite of the absolutists, appointed his successor. This excited the hatred of the nation; and Ferdinand recovering, abolished the law. To avoid imprisonment, C. fled to France. He died at Toulouse in 1842.

CALOMEL is the popular name given to one of the compounds of mercury (Hg) and chlorine (Cl), and known to scientific chemists as the subchloride of mercury (HgCl). It is prepared by taking two equal portions of mercury, dissolving one portion in hot concentrated sulphuric acid (SO_3), which forms sulphate of mercury ($HgOSO_3$), thereafter adding the second part of the metal, and triturating the whole in a mortar till the metal becomes incorporated with the sulphate of mercury. This mixture is then added to one half its weight of common salt (NaCl), and heated in a retort, when C. sublimes, and condenses in the cool part of the receiver, as a fine white powder. A minute portion of corrosive sublimate which accompanies it, is removed by washing with water. C. is very dense. It is not soluble in water, and sparingly so in acids. It turns black on the addition of lime-water, potash, soda, or ammonia; and when heated in an iron spoon, or on a knife, it does not char, but rises in vapor, sublimes unaltered, and readily condenses again on any cool surface held near it. Although C. has been more used in British practice than any other preparation of mercury, it is not known to have been employed before the 17th century. Its medicinal virtues will be treated of with the other mercurials. See MERCURY.

CALONNE, CHARLES ALEXANDRE DE, controller general of finance in France under Louis XVI., was b. Jan. 20, 1734, at Douay. Possessing superior abilities, he studied law, and having filled successively various offices, was made, in 1783, controller general of the treasury. In this capacity he soon gained favor among the courtiers, who had complained of the parsimony of Turgot and Necker. C., though he found French finance in a deplorable state, was determined not to *seem* poor, gave brilliant entertainments, paid off the debts of his patron the count of Artois, supplied the queen with sufficient pocket-money, granted pensions and gratuities to his supporters and favorites, paid off arrears, and purchased the residences of St. Cloud and Rambouillet! His means of raising money were perfectly simple—he borrowed, anticipated, issued chancery-edicts, and prolonged and augmented extraordinary taxations in a style never known before. The parliament resisted these measures, but C., backed by royal authority, carried them into execution. The crisis necessarily arrived; and in 1786, when the people could bear the extraordinary taxation no longer, C. advised the king to convoke the assembly of the notables, and proposed to abolish the privileges (exemption from taxes) of the noble and wealthy, to take the duty off salt, to abolish *socage* (feudal or compulsory service to the lord of the manor), and to distribute the burden of taxation more equally. The people and the aristocracy demanded a convocation of the states-general, instead of the assembly of the notables; but C. boldly proceeded with his plan, opened the assembly of the notables, Feb. 2, 1787, and in a pleasant and florid oration, described the general prosperity of French industry and commerce and brought his speech to a climax by confessing that the annual deficit of the treasury had risen to 115 millions of francs, and that during the time from 1776 to 1786, the government had borrowed no less a sum than about 1250 millions! The notables, instead of proceeding with C.'s plan of reorganization, demanded from him a statement of acounts. Not being able to give this satisfactorily, he was stripped of his dignities, and banished to Lorraine. After this, C. resided chiefly in England, until in 1802 he obtained from Bonaparte permission to return to France, where he died, in very embarrassed circumstances, Oct. 30, 1802.

CALOPHYL'LUM (Gr. beautiful leaf), a genus of trees of the natural order *guttiferæ* (q.v.), natives of warm climates. Some of the species yield valuable timber, as *C. angustifolium*, the PINEY TREE, which grows at Penang, and in the islands to the eastward of the bay of Bengal, and furnishes the beautiful straight spars called *peon*. The resinous products of some species are valuable, and among them are some of the substances known by the name of tacamahaca (q.v.). *C. inophyllum*, which yields true East Indian tacamahaca, is a very large and beautiful umbrageous tree, often planted for its shade and the fragrance of its flowers, which are white and in loose axillary racemes. It is one of the most valuable timber-trees of the South Sea islands. The timber resembles mahogany, being of equally close texture, although of lighter color, and very durable. The leaves are oblong and obtuse; the fruit—which in all this genus is a globose drupe or stone fruit—is about the size of a walnut; and a fixed oil is expressed from its kernel, which is used for lamps, etc. A similar oil is expressed from the seed of C. *calaba*, the CALABA TREE of the West Indies, which also has white sweet-scented flowers, and of which the timber is used for various purposes, particularly for staves and cask-headings.

CALORIC, a term for heat (q.v.).

CALORIC ENGINE. This was the name given by capt. Ericsson to his latest *air-engine*. There seems no reason for the change of name, unless it were meant to distinguish it from the previously well-known, though hitherto unsuccessful air-engines of the Messrs. Stirling. We shall in this article treat air and caloric engine as synonymous terms.

It is a well-known law, applicable to all thermo-dynamic engines, that (presupposing

the merely mechanical part of the machine to be perfect) the heat converted into work bears the same proportion to the total heat given to the fluid that the range of temperature bears to the highest *absolute* temperature of the fluid. Thus supposing an engine to receive steam * at the temperature of 275° F., and discharge it at that of 120° F., the fraction of heat which it can convert into work will be $\frac{275-120}{275+461}$ or about 21 per cent of the total heat of the fluid. This proportion would be, of course, greatly reduced in practice, owing to imperfections in the machinery, but these being equally likely to occur in all prime movers, we need not consider them here. The *lowest* limit of temperature available being practically constant, fixed either by the temperature of the atmosphere, or that obtainable in a condenser, it follows that greater economy can only be looked for in the direction of increase of initial temperature. In ordinary steam-engines, in which the pressure and temperature increase simultaneously, the latter is limited by the former, which in its turn is kept, by considerations of safety, comparatively low. When, however, *superheated* steam (steam to which additional heat has been imparted without the corresponding addition of pressure) or heated air is used, the temperature is limited only by the power of the metals composing the machine to resist the destructive action of heat, or the chemical action of the fluid at that temperature. Heated air possesses the advantage over superheated steam as a motive power, that with it an explosion, in the usual sense of the word, is rendered almost impossible, and that, if one were to occur, it would be comparatively harmless. It also, of course, enables the boiler to be dispensed with.

Air-engines, in their principal working parts, are very similar to ordinary steam-engines. The heated air is introduced into a cylinder, in which works a tightly-fitting piston, which is thus compelled to move up and down, and transfers its motion to a revolving shaft by means of a piston and connecting-rod in the usual manner. The motion of the piston results in all cases from the expansion of the heated air; the air is heated by means of a furnace, is introduced below the piston, raises it, and then is allowed to escape into the atmosphere. Air-engines are almost invariably single-acting; they are sometimes worked simply by heated air, and sometimes with the air which, having passed through the furnace, is mixed with all the gaseous products of combustion. The latter method has the immense advantage that it utilizes the heat which would otherwise be rejected into the chimney The total efficiency of the machine is thus increased, although the efficiency of the engine proper, between the given pair of temperatures, remains the same.

The more heat carried away by the discharged air—the higher its temperature, in other words—the smaller evidently is, *cæteris paribus*, the range of temperature of the machine, and the less, therefore (as already explained), will be its efficiency. The distinctive principle of the Messrs. Stirling's air engine, as of the later C. E., consists in utilizing a great part of this wasted heat, and thus economizing fuel. This is effected by means of a "regenerator," or, more properly, "economizer," consisting of a chamber filled with metallic sieves of wire-gauze, through which the hot air is made to pass *outwards* from the cylinder, after having performed its work on the working piston of the engine. As much of the heat of the escaping air is taken up by the regenerator, and its temperature thus reduced, the range of temperature of the machine is correspondingly increased. The fresh air entering the cylinder for the next stroke was compelled to pass *inwards* through the regenerator, and abstracted from it the heat left in it. In this way it did not require to receive so much heat in the furnace as would otherwise have been the case, and thus economized fuel.

This method of preventing waste of heat was first discovered by the Rev. Dr. Stirling, who obtained a patent for it in 1816. In working with air at the ordinary pressure of the atmosphere, however, the engine was found to require to be of large dimensions as compared to a steam-engine of the same power; and in order to obviate this objection, compressed air was used, the idea originating with Mr. James Stirling, C.E. Several other difficulties were successfully surmounted by the Messrs. Stirling, and eventually two improved engines were constructed, one of which was tested to fully 40 horse-power. This latter engine did all the work of the Dundee foundry company regularly for upwards of 3 years, during which period they employed no other motor. At the end of this period it was laid aside, principally owing to the repeated failure of one of the heating vessels.

Capt. Ericsson, in his attempt to introduce his C. E. in the ship which bore his name, experienced precisely the same difficulties and disappointments, and tried nearly the same remedies as the Messrs. Stirling. There seems little doubt, however, that he actually believed his "regenerator" was to make the *same heat* do work over and over again—to be a kind of perpetual motion—and under these circumstances it is not to be wondered at that his machines (notwithstanding some not very creditable maneuvering on the part of their upholders) entirely failed, and that in 2 years (1855) they were replaced by steam-engines.

Air engines have recently been constructed, in which the solar rays, concentrated by

* The law is the same for steam, air, or *any other fluid whatever.*

means of an arrangement of mirrors, are utilized as the source of heat. These have been called *solar* engines.

CALORIM'ETER, a measurer of the degree of heat (q.v.).

CALORIMO'TOR, a powerful galvanic battery devised by Dr. Hare. He placed a sheet of non-conducting substance, as paste-board, between a sheet of copper and another of zinc, rolled the whole together, and plunged the bundle into a barrel of acidulated water. As there was but one pair of plates, the intensity of the electricity produced was feeble, but because of the great surface, the quantity was large; effects which depend upon quantity, as heat, were produced in an intense degree. The same result is now attained by coupling the elements of many small cells in such a way that all the positive plates shall be united in one, and the negative plates in another.

CALO'TROPIS. See MUDAR.

CALOTTISTES (*Le Régiment de la Calotte*), a society of witty and satirical men, in the time of Louis XIV., who were headed by two officers in the king's body-guard, named Torsac and Aimon. Their name was taken from the word *calotte* (a "small cap," worn by monks over the tonsure), and their amusement consisted in sending to any public character who had exposed himself to ridicule, a "patent," authorizing him to wear the *calotte* as a covering for the weak part of his head. The armorial bearings of the *Régiment de la Calotte* consisted of various symbols of folly, with the motto, "*C'est régner que de savoir rire.*" When Torsac, its first "generalissimo," died, the society, which occupied a position of satirical hostility to the French academy, drew up a burlesque funeral oration, manufactured out of the pompously eulogistic phrases that the academicians were in the habit of using. As the society became audacious, and did not spare even royalty itself, it was dissolved by the minister Fleury. The *Mémoires pour servir à l'Histoire de la Calotte* (Basel, 1725) is an amusing little book. During the restoration, the title *Régime de la Calotte* was applied to the priestly administration of affairs.

CAL'OTYPE PROC'ESS (Gr. *kalos*, beautiful, *typos*, impression), a title comprehending a variety of methods for the production of negative photographs on paper; and so named by the inventor, the late Dr. H. Fox Talbot, who exhibited the result of his experiments in the year 1840. The *principle* involved in the C. P. depends on the susceptibility to the action of daylight of a surface chemically prepared, and the *practice* consists in the preparation, and exposure in the camera, of a sheet of paper, having on one surface an even and finely divided layer of iodide of silver, nitrate of silver, and an organic acid; the image obtained on this surface being subsequently developed with gallo-nitrate of silver. It will be unnecessary here to describe the various modifications which have been introduced with the object of imparting a high degree of sensibility to the paper; one process—the best—will suffice to describe the manipulation.

Good English paper, sized with gelatine, should be chosen. the foreign starch-sized papers being unsuitable, on account of the solutions sinking in too deeply, and thus impairing that sharpness of outline which should be possessed by a good negative. The paper is then floated on one side, and for a moment only, on a solution of iodide of silver in iodide of potassium; prepared by adding freshly precipitated iodide of silver to a *strong* solution of iodide of potassium. It is then dried, and plunged into a dish containing distilled water, which, by removing the soluble iodide of potassium, precipitates the iodide of silver in an even and finely divided condition over the whole surface of the paper, which in this state will keep good for twelve months. It is now ready to receive the *sensitive coating;* this operation, which is called *exciting* the paper, is performed in the following manner: Two solutions are prepared—one, a saturated solution of gallic acid in cold distilled water, called solution A; the other, a solution of 50 grains of nitrate of silver in 1 oz. of distilled water, to which 1 dram of glacial acetic acid has been added; this is called solution B. The iodized paper obtained as above is now laid on a board having a piece of clean blotting-paper on it a little larger than the paper to be excited, and the following solution brushed over it with a clean Buckle's brush: distilled water, 1 oz.; solution A, 15 drops; solution B, 15 drops. This mixture, prepared in a chemically clean glass vessel, should be freely applied, and the excess absorbed by clean blotting-paper. The paper is now ready for exposure in the camera, and may be at once placed in the dark slide; or a stock may be thus sensitized and preserved between folds of blotting-paper until required for use. The *time of exposure* —varying from three minutes to a quarter of an hour—is determined by the diameter and focal length of the lens employed, the aperture of the diaphragm or stop, and the amount of light prevailing at the time. The *development of the latent image*, an operation which, like the preceding, is, of course, conducted in a room illuminated only by yellow light, is accomplished by applying freely and uniformly over the whole surface solution A; and when the image begins to appear, applying a second quantity, to which a few drops of solution B have been previously added, to increase the intensity. The whole operation of development occupies about a quarter of an hour; and when the details are fully out, the picture should be washed with water, and *fixed*, by immersion in a solution of 1 part of hyposulphite of soda to 4 parts of water; it is then again freely washed in frequent changes of water during several hours; it is lastly *dried* and *waxed;* when it may be regarded as a finished negative, from which positive prints may be obtained, having the lights and shadows as in nature. See POSITIVE PRINTING.

CALO'VIUS, Abraham, 1612–86; a Lutheran minister, rector at Dantzic, and professor at Konigsberg and Wittenberg. He was a strong controvertist, and a vigorous supporter of his sect.

CALOY'ERS, a general name for the monks of the Greek church. The name is a corruption of two Greek words, *kalos* and *gerōn,* and signifies "good old men." The C. follow the order of St. Basil, and are divided into three ranks: the novices, called *archari;* the ordinary professed, called *microchemi;* and the more perfect, called *megalochemi* It is always from among them that bishops and patriarchs are chosen, because they are generally members of the most distinguished families of the upper and middle classes. The C. also furnish the only learned theologians in Greece at the present day. Their monasteries are very numerous. The most celebrated in Asia is that of Mt. Sinai, founded by the emperor Justinian, and endowed with a revenue of 60,000 crowns. In Europe, Mt. Athos alone has twenty, the inmates of which have so great a reputation for sanctity, that even the Turks seek an interest in their prayers. The C. are obliged to labor for the benefit of their monastery as long as they continue in it. Their religious services occupy an unnaturally large portion of their time, beginning at midnight and continuing at intervals until sunset. They observe four Lents: the first, of eight weeks, in commemoration of the resurrection of our Lord; the second, of three weeks, in honor of the holy apostles; the third, of fourteen days, in commemoration of the assumption of the Virgin; and the fourth, in commemoration of the advent.—There are also female C., or Greek nuns, who likewise follow the rule of St. Basil.

CAL'PE. See Hercules, Pillars of, *ante.*

CALPEE, a city of Jhansi, one of the n.w. provinces of India, on the right bank of the Jumna, in lat. 26° 7′ n., and long. 79° 48′ east. Pop. '72, 15,570. It is an entrepôt for the cotton of the neighboring district. It has manufactures of cotton and paper, and is celebrated for the beauty of its refined sugar. It became British by capture and cession, respectively, in 1803 and 1806. It is 51 m. s.w. of Cawnpore, and is closely linked with it in the history of the insurrection of 1857–58, as the head-quarters of the Gwalior contingent.

CALPENTYN', a long and narrow peninsula on the w. side of Ceylon, in lat. 8° 14′ n., and long. 79° 53′ east. The neck is so low as to be overflowed during the n.e. monsoon, so that it is transformed into an island.

CALPURNIUS. The Calpurnia gens was, by its own account, one of the oldest plebeian clans in Rome; but it does not figure in history till the time of the first Punic war. The family names, in the time of the republic, were Bestia, Bibulus, Flamma, and Piso.—Marcus Calpurnius Bibulus is known as the hostile but incapable colleague of Cæsar (q.v.) in the consulate. He was put up by the aristocratic party, who spent vast sums to carry the election. He finally joined the Pompeian party, had command of the fleet intended to prevent Cæsar's passage to Greece, and died 48 B.C., before the battle of Dyrrhachium. Among the Roman women of this family, two are celebrated—Calpurnia, the daughter of Calpurnius Piso (consul 58 B.C.), and the last wife of Cæsar, who seems, from the scanty notices of her we possess, to have been a quiet domestic woman, full of love and solicitude for her great husband; and Calpurnia, the daughter of L. Calpurnius Bestia, wife of P. Antistius, who killed herself when her husband was murdered by order of the younger Marius, 82 B.C.

CALPUR'NIUS, Titus Julius, surnamed Siculus, a pastoral poet who lived in Sicily about the end of the 3d century. He seems to have been an imitator of Virgil, but beyond his complaining of poverty nothing is known of his personal history.

CALTABELLO'TA (a Saracenic name = "the castle of the cork-trees"), a t. of Sicily, Girgenti, 7 m. n.e. of Sciacca, most picturesquely situated around an ancient castle, which crowns a steep rock overhanging a stream (anc. *Crimisus*), of the same name as the town. Of its churches the *Chiesa Matrice* is a beautiful relic of the middle ages, resembling a mosque, with a single row of columns down the middle. C. was captured by the Saracens in 840 A.D. Pop. 6200.

CALTANISET'TA, a province in Sicily s. of Palermo; 1455 sq.m.; pop. '71, 230,066. The soil is fertile, producing grapes, olives, almonds, hemp, cotton, etc. Marble, agate, alabaster, sulphur, and iron ore are found. Agriculture is the chief industry, but there are foundries and manufactories of chemicals.

CALTANISET'TA, a fortified t. of Sicily, situated on a fertile plain near the Salso, about 28 m. n.e. of Girgenti. It has mineral springs and extensive sulphur-works. Pop. '81, 30,031.

CALTAVUTU'RO, a t. of Sicily, province of Palermo, and 37 m. s.e. of the city of that name, on a small river, the Grande. The town is of Saracenic origin. Jasper is found near C. Pop. 5000.

CAL'THA. See Marsh Marigold.

CALTO'NICA, a t. of Sicily, about 15 m. n.w. of Girgenti. It has pretty extensive sulphur-works and salt-works. Pop. 7000.

CALTROP, Calthrop, or Calthorp, in military warfare, is a four-pronged piece of iron, each prong about four in. in length. When it is wished to check the approach of

the enemy's cavalry over a plain, or of his besiegers in the ditch of a fortification, caltrops are sometimes thrown down; from their shape, one prong is sure to stand upright, and may work terrible mischief to the enemy's horses or men.

CALUIRE, a t. of France, in the department of the Rhone, situated on the left bank of the Saone, about 3 m. n.n.e. of Lyon. It has three annual fairs. Pop. '76, 7207.

CALUMBA, or COLOMBO, very extensively used in medicine, is the root of *cocculus palmatus,* a herbaceous plant of the natural order *menispermaceæ* (q.v.). It is said to derive its name from Colombo in Ceylon, although the C. now chiefly in use is the produce of Mozambique. The flowers in this genus have 12 sepals and petals in all, similar in appearance, and disposed in four rows. The male and female flowers are on separate plants. *C. palmatus* has nearly circular leaves with 5 to 7 lobes, on long hairy foot-stalks, and solitary axillary racemes of small green flowers, the racemes of the male plants branching. The fruit is a drupe, or 1-seeded berry-like fruit, about the size of a hazel-nut, densely clothed with long hairs. The stem is annual and twining; the root perennial, consisting of clustered spindle-shaped fleshy tubers, with a brown warty epidermis, and internally deep yellow. The plant is not cultivated: the root is collected where it grows wild in dense forests. It is dug up in Mar., cut into slices or short cylindrical pieces, and dried in the shade. In this state it appears in commerce, having a greenish-yellow tint, a very bitter taste, and a faint aromatic odor. Its bitterness is ascribed to a somewhat narcotic principle called columbine, and to *berberine,* an alkaloid originally discovered in the barberry (q.v.), which is also present in it. C. is regarded as one of the most useful stomachics and tonics. It is demulcent, not at all stimulant, and capable of being employed in cases in which almost every other tonic would be rejected by the stomach. It is sometimes given to allay vomiting. It has been found very useful in diarrhea and dysentery. It is administered in the form of powder, infusion, or tincture. Similar properties seem to reside in the roots of the species of *cocculus* generally.—The very poisonous seed known by the name of cocculus Indicus (q.v.), belongs to a plant of a different but allied genus.—The root of *frasera walteri* is sometimes fraudulently substituted for C., and has been called American calumba root. It does not agree with C. in its properties, but, besides its very different appearance, it may be distinguished by its undergoing no such change of color when touched with tincture of iodine, as in true C. root is produced by the presence of starch. See FRASERA.

CALUMET, the "peace-pipe" of the North American Indians, is a tobacco-pipe having a stem of reed about two feet and a half long, decorated with locks of women's hair and feathers, and a large bowl of polished marble. It plays an important part in the conclusion of treaties, of which, indeed, it may be described as the ratifier. After a treaty has been signed, the Indians fill the C. with the best tobacco, and present it to the representatives of the party with whom they have been entering into alliance, themselves smoking out of it afterwards. The presentation of it to stangers is a mark of hospitality, and to refuse it would be considered an act of hostility.

CALUMET, a co. in e. Wisconsin, on Winnebago lake; 360 sq.m.; pop. '80, 16,631. It is a hilly region, but with abundance of timber and good pasturage, and produces grain, hay, hops, wool, etc. Co. seat, Chilton.

CALUMET, a t. and village in Houghton co., Mich., on the Mineral Range railroad; pop. of township '80, 8291. In the town is a copper-mine supposed to be the richest in the world; employing from 1800 to 2000 men and yielding annually 12,000 to 15,000 tons of pure copper. There are some manufactures in the village.

CALUMNY. An ancient regulation of the Scotch law obliged litigants to give their *oath of C.*—that is, they swore, either by themselves or by their counsel, that the facts alleged by them were true, although in practice this oath was not usually put unless one of the parties required it of his adversary. In the modern practice, however, of the court of session, this oath is confined to actions for divorce, and other consistorial cases —the object being to guard against collusion between the husband and wife. See DIVORCE.

CALUMNY, LAW AS TO. See LIBEL.

CALU'SO, a t. of n. Italy, in Piedmont, province of Turin, about 11 m. s. of Ivrea, and connected with Turin by railway. Pop. 3500.

CALVADOS, a maritime department in the n.w. of France, bounded n. by the English channel, and e., w., and s. by the departments of Eure, Manche, and Orne. It is formed out of a part of the old province of Normandy. The principal rivers are the Touques, Orne, Dives, Seulle, Dromme, and Vire. The coast, which has few bays or inlets, is partly formed by bold ridges, and partly by sand-downs, cliffs, and reefs. The reef extending between the mouths of the Orne and the Vire, called Calvados, after one of the vessels in the Spanish armada shipwrecked here, and from which the department takes its name, is very dangerous to navigation. The soil of the department is generally fertile, especially in the valleys, supplying rich pasturage for horned cattle, sheep, horses, and swine, which constitute the principal wealth of Calvados. The climate is healthy, though changeable. Iron, marble, slate, and coal are found. There are various manufactures, and the coast-fisheries are of some importance. C. has an area of 2130

sq.m., with a pop. in 1876 of 450,220, and is divided into six arrondissements. Caen is the capital.

CALVAERT, Dionys, called also Dionisio Flammingo, a distinguished painter, especially in landscape, was b. at Antwerp in 1555. He settled early at Bologna, where he opened a school, and had among his students the celebrated Domenichino, Guido, and Albani, who were, afterwards, however, pupils of the Caracci. Many excellent pictures by him are still preserved at Bologna. He died in 1619.

CALVARY, Mount, the scene of our Savior's crucifixion, is an eminence which lay at the n.w., and just on the outside, of the ancient city of Jerusalem. Calvary, or Calvaria, is a translation into Latin of the Hebrew word Golgotha, signifying a "skull," either because the mount was a place of public execution, or because it was shaped like a human skull.

CALVARY, in Roman Catholic countries, is a representation of the various scenes of the passion and crucifixion of our Lord, either in a chapel, or external to the church, as at St. Jacques at Antwerp. Is consists of three crosses with the figures of Christ and the thieves, usually as large as life, surrounded by a number of figures, representing the various personages who took part in the crucifixion. At Aix-la-Chapelle, the C, is a church on the top of a hill, surrounded by twelve sculptured stones, each marking an event which took place on the journey of the Savior to Mount Calvary. The approach to the C. is called the *Via Dolorosa*, each of the stones marking what is called a station, at which the pious say a prayer in passing.

CALVEL'LO, a t. in the province of Basilicata, Italy, pleasantly situated on a hill-slope about 13 m. s. of Potenza. It has two convents. Pop. 5650.

CALVENTU'RA ISLANDS, off the coast of Arracan, in the bay of Bengal, their center being in lat. 16° 53′ n., and long. 94° 20′ east. The group consists of two divisions—one to the s.e., which is composed of two lofty and well-wooded islets; and another to the n.w., which presents seven bare rocks, chiefly of fantastic shapes.

CALVERT, a co. in Maryland, on Chesapeake bay; 250 sq.m.; pop. '80, 10,538—5696 colored. Its surface is rolling, with good soil, having marl in abundance. The chief productions are tobacco, corn, and oats. Co. seat, Prince Frederick.

CALVERT, George and Cecil. See Baltimore, Lord.

CALVERT, George Henry, b. Baltimore, 1803; a graduate of Harvard, and for a long time editor of the Baltimore *American*. In 1832, he published *Illustrations of Phrenology*, the first treatise on the subject issued in this country. Among his works are a *Metrical Version of Schiller's Don Carlos; Scenes and Thoughts in Europe; Cabiro*, a Don Juanic poem; *An Introduction to the Social Sciences; The Gentleman; Aynta and Other Poems; First Year in Europe; Ellen, a Poem;* and *Goethe, his Life and Works.* In 1843, he removed to Newport, R. I., of which city he was chosen mayor in 1853.

CALVERT, Leonard, 1582–1647; brother of the second lord Baltimore, and first governor of Maryland. In 1633, he led the first expedition to Maryland in two small vessels, and on the 25th of Mar., 1634, at St. Clement's island on the Potomac, a regular mass was celebrated. Immediately afterwards they settled on the right bank of a river called by them St. George, and founded the prospective city of St. Mary, no signs of which now remain. After much difficulty with the people of Virginia the colonists under Calvert were fully established, and in 1647 his name as governor of the province was recognized.

CAL'VI, a seaport on the island of Corsica, situated on a peninsula in the gulf of Calvi, about 38 m. w.s.w. of Bastia, lat. 42° 35′ n., long. 8° 43′ east. It is strongly fortified, and has a good port, with a high light at its entrance, and a considerable export trade. C. was captured by the English in 1794, after a siege of 51 days. Pop. '72, 1969.

CAL'VILLE, a kind of apple, of which there are numerous sub-varieties. The calvilles diminish in thickness from the middle towards the calyx, where they form a point; they have regular ribs and a large open seed-chamber; also a pleasant smell, and are unctuous to the touch. They are never altogether streaked; they have a fine loose flesh, with a flavor somewhat resembling that of the raspberry or strawberry. The white winter C. is in high repute both as a culinary and dessert apple; it is very extensively cultivated on the continent of Europe.

CAL'VIN, John, one of the most eminent of the reformers of the 16th c., was b. at Noyon, in Picardy, on the 10th of July, 1509. His father, Gerard Cauvin or Calvin, was procureur-fiscal of the district of Noyon, and secretary of the diocese. He was one of six children—four sons and two daughters. All the three sons who survived were bred ecclesiastics; and the reformer himself, while still only 12 years of age, was appointed to a chaplaincy in the cathedral church of Noyon. This he held as a means of support during the period of his education, and even for some short time after he had entered on his reforming career. C. was educated in circumstances of ease, and even affluence. The noble family of Mommor, in the neighborhood, invited him to share in the studies of their children; he was in some measure adopted by them; and when the family went to Paris, in his 14th year, he accompanied them, and participated in the benefits of the higher instruction which was there attainable. He was entered as a pupil in the collége

de la Marche, under the regency of Mathurin Cordier, better remembered, perhaps, by his Latin name of Corderius. It was under this distinguished master that C. laid the foundation of his own wonderful mastery of the Latin language. During this early period, he was distinguished by the great activity of his mental powers, and the grave severity of his manners. His companions, it is said, surnamed him the "Accusative."

For awhile, his attention was directed to the study of law. His remarkable talents seemed to promise great success in this branch of study, and his father sent him, with the view of prosecuting it, to the university of Orleans, then adorned by Pierre de l'Etoile, one of the most famous jurists of his day, and afterwards president of the parliament of Paris. At Orleans, he continued the same life of rigorous temperance and earnest studiousness for which he was already noted. Beza says that, after supping moderately, he would spend half the night in study, and devote the morning to meditation on what he had acquired. His undue habits of study seem to have laid thus early the foundation of the ill-health which marked his later years. It was while a law-student in Orleans that he became acquainted with the Scriptures, and received his first impulse to the theological studies which have made his name so distinguished. A relative of his own, Pierre Robert Olivetan, was there engaged in a translation of the Scriptures; and this had the effect of drawing C.'s attention, and awakening within him the religious instinct which was soon to prove the master-principle of his life. We cannot say as yet that his traditionary opinions were unfixed, or that he had embraced with any decision the Protestant opinions that were spreading everywhere; but the seeds of the new faith were now beyond doubt sown in his heart, and from this time, although he still continued for awhile longer to pursue his legal studies, his main interests appear to have been religious and theological. From Orleans he went to Bourges, where he acquired the knowledge of Greek, under the tuition of a learned German, Melchior Wolmar, to the influence of whose spiritual instructions he was also greatly indebted. He began here to preach the reformed doctrines, and passed over into the ranks of Protestantism, under the slow but sure growth of his new convictions, rather than under the agitation of any violent feeling. Here, as everywhere, his life presents a marked contrast to that of Luther.

He proceeded to Paris in 1533, which at this date had become a center of the "new learning," under the teaching of Lefevre and Farel, and the influence of the queen of Navarre, sister of Francis I. The Sorbonne itself had not escaped the infection. There was a growing religious excitement in the university, in the court, and even among the bishops. This, however, was not to last. The king was soon stirred up to take active measures to quell this rising spirit; and the result was that C. and others were obliged to flee for their lives. The story is that C. narrowly escaped, having descended from his window by means of his sheets, and fled, under the guise of a vine-dresser, a friend of his, in whose clothes he concealed himself. After this he repaired for a short time to his native place, resigned the preferment he held in the Roman Catholic church, and for a year or two led a wandering life, sheltered in various places. We find him at Saintonge; at Nerac, the residence of the queen of Navarre; at Angoulême, with his friend Louis Tillet; then for a brief while at Paris again, strangely enough expecting a meeting with Servetus, who had expressed a desire to see and confer with him. Persecution against the Protestants at this time raged so hotly, that C. was no longer safe in France; and he betook himself to Basel, where he is supposed to have prepared the first edition of the *Institutes of the Christian Religion*, and whence he certainly issued, in the year 1535, the famous preface addressed to Francis I. The concentrated vigor of this address, its intensity of feeling, rising into indignant remonstrance, and at times a pathetic and powerful eloquence, make it one of the most memorable documents in connection with the reformation. It is throughout a noble defense of the righteous character of the reformed doctrines, and their support alike in Scripture and in history. The energetic decisiveness and moral zeal of the future teacher and legislator of Geneva, speak in every page of it. After completing this great service to the cause of Protestantism, he made a short visit to Italy, to Renée, the duchess of Ferrara. Finally, he revisited his native town; sold the paternal estate, which had devolved to him on the death of his eldest brother; and bidding it adieu, set out in company with his younger brother and sister on his way to Strasburg. The direct road being rendered dangerous by the armies of Charles V., which had penetrated into France, he sought a circuitous route through Savoy and Geneva.

The result of this journey was memorable for the cause of the reformation. Arrived in Geneva, he met there his friend, Louis Tillet, who communicated the fact of his arrival to Farel, then in the very midst of his struggle to promote the reformation in the city and neighborhood. Farel hastened to see him, and urge upon him the duty of remaining where he was, and undertaking his share of the work of God, under the burden of which he was like to fail. C. did not at first respond to the call. He was given, he himself says, to his "own intense thoughts and private studies." He wished to devote himself to the service of the reformed churches generally, rather than to the care of any particular church. A life of intellectual and theological labor was that which at that time was most congenial to him. By some strange insight, however, Farel penetrated to the higher fitness of the young stranger who stood before him, and he ventured, in the spirit of that daring enthusiasm which characterized him, to lay the curse of God

upon him and his studies if he refused his aid to the church of Geneva in her time of need. This seemed to C. a divine menace. "It was," he said, "as if God had seized me by his awful hand from heaven." He abandoned his intention of pursuing his journey, and joined eagerly with Farel in the work of reformation.

Such was the beginning of C.'s great career in Geneva. Having entered upon his task, he soon infused an energy into it which crowned the struggling efforts of Farel with success. The hierarchical authority was already overturned before his arrival; the citizens had asserted their independence against the duke of Savoy, whose alliance with the corrupt episcopate, which was the direct governing influence in the place had called forth the patriotic as well as the religious feelings of the people. The magistrates and people eagerly joined with the reformers in the first heat of their freedom and zeal. A Protestant confession of faith was drawn out, approved of by the council of two hundred, the largest governing board of the city, and then proclaimed in the cathedral church of St. Peter's as binding upon the whole body of the citizens. Great and marvelous changes were wrought in a short time upon the manners of the people; where license and frivolity had reigned, a strict moral severity began to characterize the whole aspect of society. The strain, however, was too sudden and too extreme. A spirit of rebellion to the rule of C. and Farel broke forth; they refused to yield to the wishes of a party animated by a more easy and liberal spirit than themselves, and known in the history of Geneva under the nickname of Libertines; and the consequence was, that they were both expelled from the city after less than two years' residence.

C. retreated to Strasburg, where he had meant to go when arrested in his course at Geneva. Here he settled, and devoted himself to theological study, and especially to his critical labors on the New Testament. Here, also, in Oct., 1539, he married the widow of a converted Anabaptist. The marriage appears to have proved a happy one, although not of long duration.

The Genevans found, after a short time, that they could not well get on without Calvin. His rule might be rigid; but an authority, even such as his, which might gall from its severity, was better than no settled authority at all; and the libertine party seem to have been unable to construct any efficient and beneficent form of government. Accordingly, they invited C. to return; and after some delay on his part, in order to test the spirit in which they were acting, he acceded to their invitation, and in the autumn of 1541, after three years' absence, once more made his entry into Geneva.

Now, at length, he succeeded in establishing his plan of church-government, in all its forms and details. By his college of pastors and doctors, and his consistorial court of discipline, he founded a theocracy, with himself at the head of it, which aimed virtually to direct all the affairs of the city, and to control and modify both the social and individual life of the citizens. Not without a struggle, it may be supposed, did he succeed in his great autocratic scheme. The libertines, although dishonored by their ineffectual attempts to maintain order in the city, and uphold its rights and dignity, still remained a strong party, which was even augmented, after C.'s return, by men such as Amy Perrin, who had strongly concurred in the invitation to C., but who were afterwards alienated from him by the high and arbitrary hand with which he pursued his designs, as well as by their own schemes of ambition. The struggle with this party lasted with various fortune for no less a period than 15 years, and was only terminated in 1555, after a somewhat ridiculous *émeute* in the streets. Amy Perrin and others, driven from the city, were executed in effigy; and the reformer's authority from this date confirmed into an absolute supremacy.

During the period of this long struggle with the libertines, C. had many other disputes, in which he conducted himself with no less heartiness and zeal. The most remarkable of these were his controversies with Sebastian Castellio, Jerome Bolsec, and above all, Michael Servetus.

C. had become acquainted with Castellio at Strasburg. They entertained at first a warm friendship for each other, and C. showed great zeal in assisting Castellio, whose poverty and learning had attracted his sympathy. When he returned to Geneva, he invited Castellio to join him there, and procured for him the title of regent or tutor in the gymnasium of the city. There was little similarity, however, in the characters of the two men, and the diversity of their tastes and views soon became apparent. The learning of Castellio was intensely humanitic; a classical spirit and a somewhat arbitrary opinionativeness molded all his studies; and as soon as he began to apply himself to theology, he came into conflict with Calvin. In a letter to Farel in 1542, we find C. speaking of the freaks of "our friend Sebastian, which may both raise your bile and your laughter at the same time." These freaks relate to Castellio's notions of scriptural translation, and his refusal of C.'s offer to revise the version which he had made of certain parts of Scripture. Then, two years later, when Castellio desired to enter into the ministry, C. dissuaded the council from accepting him, on account of some peculiar opinions which he held. These were certain rationalistic views as to the authenticity and character of the Song of Solomon, the descent of Christ into hell, and also about election. After this, Castellio left Geneva for awhile, but soon returning, he attacked the views of C. openly. After a violent scene in church, which is painted in C.'s letters very strongly, he was forced to leave the city. The two old friends, now declared enemies, did not spare each other henceforth. The fate of Servetus drew forth an anonymous publication, attacking

with keen logic and covert and ingenious sarcasm the Genevan doctrines. This publication was attributed by both C. and Beza to Castellio, and they replied to him in no measured terms, stigmatizing him as a "deceiver and vessel of Satan." One fact really disgraceful to C. in the controversy deserves not to be passed over. Sunk in great poverty, Castellio was obliged, in his old age, to gather sticks on the banks of the Rhine at Basel, as a means of support. C. did not hesitate to accuse him of stealing the sticks. Such polemical truculence may well make us turn away in disgust and indignation.

The controversy with Bolsec belongs to a later period. Jerome Bolsec was originally a Carmelite monk, but he had thrown aside the habit, and betaken himself to the practice of medicine in Geneva. He was led to attack C.'s doctrine of predestination. As soon as C. heard of this, he led him to understand that he was not at liberty to question the Genevan docrine. He and the other clergy dealt with him; but after repeated disputations Bolsec was found incorrigible, and was sentenced to banishment from the city. Cast out of the theocratic community, he ultimatety re-joined the Roman Catholic church, and revenged himself in a somewhat mean way against C. by writing his life in a spirit of detraction and slander.

Of all these contests, however, the most memorable is that with Servetus. A melancholy interest encircles the name of this great heretic, which the criminal tragedy of his death keeps always fresh and vivid in the minds of all who hate intolerance, and who love truth rather than dogmatism. The character of Servetus himself has little to do with this interest. He seems to have been more of a vain, restless, and enthusiastic dreamer, than of a calm and patient inquirer. In his very dreams, however, and the vague audacities of his speculation, there is a kind of simplicity and unconscious earnestness that wins sympathy. He had entered into various connections with C., even from the time of his early residence in Paris; particularly, he had sent him various documents containing the views, fully developed in his work subsequently published under the title of *Restitutio Christianismi.* C. never concealed his abhorrence of these views; and in a letter to Farel as early as 1546, he threatens that if Servetus should come to Geneva, he would do what he could to bring him to condign punishment: *Nam si venerit, modo valeat mea authoritas, vivum exire nunquam patiar.* The history of his seizure and condemnation at Vienne by the Catholic authorities, and especially of C.'s share in the correspondence which led to his seizure, is very complicated and obscure. It has been maintained that C. was the instigator, through a creature of his own of the name of Trie, of the whole transaction; it *is certain* that he forwarded to the authorities, through Trie, private documents which Servetus had intrusted to him, with a view to the heretic's identification, and as materials for his condemnation. Servetus was sentenced to be burned, but effected his escape, and, after several months' wandering, he was found at Geneva. It was his intention to proceed to Italy, where he hoped his opinions might meet with some degree of toleration, and he arrived at Geneva on his way. This is the explanation of an event otherwise unaccountable. Having ventured to church, according to the common account, he was recognized, apprehended, and conveyed to prison by C.'s order, just as he was about to leave the city. The particulars of his trial are full of interest, but too lengthened to be detailed here. It lasted, with various interruptions, for two months. He attacked C. with the most foul epithets, and C. retorted with a virulence and foulness quite equal to his own. At length, on the 26th of Oct., 1553, sentence was passed upon Servetus, condemning him to death by fire. C. used his influence to have the mode of death alleviated, but without success. On the very next morning, the sentence was put into execution. On an extended eminence at some distance from the city, Servetus was fastened to a stake surrounded by heaps of oak-wood and leaves, with his condemned book and the MS. he had sent to C. attached to his girdle; and, amid his agonizing cries, the fire was kindled, and the wretched man expiated his heresy amidst the flames. Whatever apologies may be urged for this memorable crime, it must remain a mournful and scandalous blot on the history of the reformation. The disgrace of it has particularly attached to C., and with some justice, from the special and unhappy relation which he bore to the whole transaction; but most of the reformers are no less implicated in it. The wise Bullinger defended it, and even the gentle Melanchthon could only see cause for gratitude in the hideous tragedy.

After the execution of Servetus, and the expulsion of the Libertines, two years later, C.'s power in Geneva was firmly established, and he used it vigorously and beneficently for the defense of Protestantism throughout Europe. By the mediation of Beza, he made his influence felt in France in the great struggle that was there going on between the hierarchical party, with the Guises at its head, and the Protestants, led by Condé and Coligny. In 1561, his energies began to fail. He had been long suffering from bad health, but his strength of will and buoyancy of intellect sustained him amid all his bodily weakness. In the year now mentioned, his bad health greatly increased, and although he survived for more than two years, he never regained any vigor. He died on the 27th of May, 1564.

Very different estimates, it may be imagined, have been formed of C.'s character, according to the point of view from which it is contemplated. None, however, can dispute his intellectual greatness, or the powerful services which he rendered to the cause of Protestantism. Stern in spirit, and unyielding in will, he is never selfish or

petty in his motives. Nowhere amiable, he is everywhere strong. Arbitrary and cruel when it suits him, he is yet heroic in his aims, and beneficent in the scope of his ambition. Earnest from the first, looking upon life as a serious reality, his moral purpose is always clear and definite—to live a life of duty, to shape circumstances to such divine ends as he apprehended, and, in whatever sphere he might be placed, to work out the glory of God.

He rendered a double service to Protestantism, which, apart from anything else, would have made his name illustrious: he *systematized its doctrine*, and he *organized its ecclesiastical discipline*. He was at once the great theologian of the reformation, and the founder of a new church polity, which did more than all other influences together to consolidate the scattered forces of the reformation, and give them an enduring strength. As a religious teacher, as a social legislator, and as a writer, especially of the French language, then in process of formation, his fame is second to none in his age, and must always conspicuously adorn the history of civilization. Among C.'s most important works are: *Christianæ Religionis Institutio* (Basel, 1536); *De Necessitate Reformandæ Ecclesiæ* (1544); *Commentaires sur la Concordance ou Harmonie des Evangélistes* (Gen. 1561); *In Novum Testamentum Commentarii; In Libres Psalmorum Commentarii; In Librum Geneseos Commentarii.* The first edition of C.'s whole works is that of Amsterdam, 1671, in 9 vols. fol. A complete critical edition by Baum, Cunitz, and Reuss began to appear at Brunswick in 1869. By the "Calvin translation society," in Edinburgh, his works have been collected, translated into English, and issued in 51 vols. 8vo, 1843–55. Besides the original *Vita* by Beza, there are lives of C. by Bolsec (from the Catholic standpoint, 1577; new ed. 1875), Audin (1840), Bungener, Viguet and Tissot (1864); and in Germany, by Henry (1844), Stähelin (1863), and Kampschulte (vol. i. 1869).

CALVINISM is the system of religious doctrine associated with the name of Calvin, and supposed to distinguish the churches more particularly called the reformed, in contradistinction to the Lutheran and Anglican churches. Calvin's doctrinal views are laid down at length in his *Institutio Christianæ Religionis*, first published in 1536. It was not till many years later however, that the name of C. came to be attached to a certain set of doctrinal opinions, and not till the rise of Arminius (q.v.) and the synod of Dort (q.v.) in 1618, that these opinions may be said to have been polemically marked off from others with which they are generally contrasted, and to which they are recognized as standing in opposition,

The difference of thought expressed in the Arminian and Calvinistic systems is as old as the history of Christian doctrine. In almost every point, Augustine may be said to have anticipated Calvin; while Pelagius and the eastern divines, such as Chrysostom, represented a type of opinion upon the whole consonant to that which in more modern times has been opposed to Calvinism. In the Roman Catholic church, since the reformation, the same opposition of thought has presented itself in the famous contest of Jansenism and Jesuitism.

The main point of distinction in the two systems or modes of Christian opinion, is as to the operation of divine grace in the salvation of sinners. In the one system, this operation is considered as predetermined and absolute; in the other, as merely prescient, and in some sense conditioned. *Predestination* and *irresistible grace* are the great keynotes of C.—its two main points. Others were added in opposition to Arminianism—viz., *original Sin, particular redemption*, and the *perseverance of the saints;* but the first of these is not peculiarly Calvinistic, and the last two are merely corollaries from the doctrines of predestination and grace. Predestination is, in fact, the one distinguishing doctrine of the system, as it was of Augustinianism, of which C. was merely the revival. The divine will, apprehended as decretive and predestinating, is necessarily *irresistible* in its efficacy, *select* in its objects, and *persevering* in its results. The characteristic of C., therefore, is that it is a speculative Christian system, springing from a single great principle, carried out rigorously into all its logical consequences.

The church of England, in its earlier history, was Calvinistic in its creed, although mediæval and Catholic in its ritual. Puritanism was nothing else than a movement to reduce it altogether to a Calvinistic model. In the reaction which followed this movement, the church of England, while retaining its original articles, nearly parted with its Calvinistic faith; and throughout the 18th c., its chief divines are conspicuously Arminian or latitudinarian. But with the revival of the evangelical party in the end of the century, C. revived; and it still maintains, if not an absolute sway, yet a powerful influence over many minds in the Anglican establishment, while it is the professed creed of a great proportion of the dissenters.

The church of Scotland, along with the other Presbyterian churches in this country, and the large and numerously increasing bodies of Presbyterians in America, all hold to the Westminster confession of faith, the most elaborate and formal expression of Calvinistic doctrine that exists. But while holding to the same Calvinistic standard, these churches show many varieties of actual opinion; and in the history of Presbyterianism, C. has shown a tendency in its logical development to pass into rationalism or Unitarianism. This is conspicuously the case in the church of Geneva itself, and some of the old Puritan churches of America. It still remains, however, as opposed to Arminian, Socinian, or any cognate forms of the same type of doctrine, the most living and powerful among the creeds of the reformation.

CALVINISTIC METHODISTS, in Great Britain, are in three divisions: the Whitfield Connection, 1741; Lady Huntingdon Connection, 1748; and Welsh Methodists, 1750.

CALVI'SIUS, SETHUS, 1556–1617; an astronomer and chronologist of Germany, who organized a system of chronology embodying the history of the world. The work was commended by Scaliger and Casaubon, but was condemned in the *Index Expurgatorius*. In 1612, he published a work on the Gregorian calender, undertaking to show the inadequacy of that system and to supplant it with one founded upon astronomical principles.

CALW, or KALW, an important manufacturing t. in Würtemberg, chief seat of the Würtemberg timber-trade with Holland, and capital of a bailiwick of the same name, in the circle of the Black forest, lies in the valley of the Nagold, on both sides of the stream, over which are two stone bridges. Cotton and woolen spinning, dyeing turkey-red, manufacturing woolen and cotton fabrics, making leather, stout shoes, cigars, etc., are the principal industries. Though the streets in the old town are irregularly built, there are many large and beautiful houses. Pop. '71, 5582; '75, 4642; nearly all Protestants.

CALX is the Latin term for quicklime. As quicklime is produced by burning limestone, the alchemists applied the term C. to the product obtained by burning any ore or other mineral substance; and *calcination* (q.v.) to the process.

CALYCAN'THUS (Gr. calyx-flower), a genus of plants of the natural order *calycanthaceæ*, an order allied to *rosaceæ*, and of which only a few species are known, natives of North America and Japan—shrubs, with square stems, which are of remarkable structure, having around the central woody axis four smaller imperfect ones. An aromatic fragrance characterizes this order. In the genus C., the bark and leaves possess it as well as the flowers. The bark of *C. floridus*, a native of Carolina, has been used as a spice and carminative, and has acquired the name of Carolina allspice, or American allspice. The flowers are of a chocolate color.

CAL'YDON, an ancient city of Ætolia, 7½ m. from the sea on the river Evenus, said to have been founded by Calydon, son of Ætolus, to have been the scene of the hunting of the Calydonian boar by Meleager and other heroes, and to have sent soldiers to the Trojan war. In 391 B.C., it was in possession of the Achæans, and so late as the time of Pompey, it was a place of importance. In 31 B.C., Augustus removed the inhabitants to Nicopolis, a city then founded to commemorate the victory of Actium.

CALYDO'NIAN BOAR. Once upon a time, according to a Greek myth, a certain Œneus, king of Calydon, the ancient capital of Ætolia, omitted a sacrifice to Diana, whereupon the goddess, in her rage, sent into his fields a frightful boar, which committed great devastation. No one had the courage to hunt it except Meleager, the son of Œneus, who, calling to his help the bravest heroes of Greece—Theseus, Jason, Nestor, and others—pursued and slew the monster. Later writers, however, affirm that he found it impossible to destroy the animal, until Atalanta, his mistress, aided him by piercing it with an arrow.

CALYM'ENE, a genus of the fossil order trilobites (q.v.). It differed from the other genera of the order in the individuals having the power of rolling themselves into a ball, so that they are often found coiled up like an oniscus, i.e., hog-louse—*vulgo*, a slater. The genus is characteristic of the Silurian formation. The species we figure has been long known as the "Dudley locust." It is remarkable as a very long-subsisting species, passing from the Caradoc beds to the Ludlow rocks. Twenty species have been described.

CALYP'SO, in Grecian legend, was, according to Homer, the daughter of Atlas, and inhabited the solitary wooded isle of Ogygia, far apart from all gods and men. Ulysses being thrown upon her island by shipwreck, she treated him kindly, and promised him immortality if he would marry her. He was fascinated by her charms, but unwilling to desert his wife and his native land; she detained him, however, seven years, and bore him two sons. On his departure, she died of grief.

CALYP'SO BOREAL'IS, an orchid with heart-shaped leaf, and beautiful yellow, pink, and purple flowers; growing in the bogs and moist woodlands of the United States and Canada.

CALYPTRÆ'A (Gr. *kalyptra*, a head-dress), a genus of gasteropodous mollusks, of the order *pectinibranchiata*, the type of a family, *calyptræidæ*, formerly included in the genus *patella*, or limpet, when the mere form of the shell was more regarded in classification than the structure of the animal, and still known as chambered limpets, cup-and-saucer limpets, bonnet limpets, and slipper limpets. The shell is limpet-shaped, but the apex is more or less spiral, and has a calcareous process from its inner surface for the attachment of a principal muscle. The *calyptræidæ* differ much in shape, some being very flat, and others very conical; some elongated and slipper-like. The species are generally natives of the shores of warm climates. Only two are British.—*Calyptræidæ* are common in the older fossiliferous rocks.

CA'LYX (a term originally Greek), in botany, the outermost of the circles of modified leaves which surround the parts of fructification, and along with them constitute the flower. Within the C. there is generally at least a second circle of leaves, called the corolla (see COROLLA and FLOWER); but this is sometimes wanting, and the C. is

the only envelope of the parts of fructification. The leaves of which the C. is composed are called *sepals*, when quite separate from each other; but they often grow together into a tube at the base, and the C. is then said to be *monosepalous* or *gamosepalous* (*monos*, one; *gamos*, union). The sepals are generally simple and without stalks; they are generally green, and differ much less widely from ordinary leaves than the petals or leaves of the corolla; sometimes, however, they are *petaloid*, and brightly colored, as in *fuchsia*. The C. and corolla of many endogenous plants resemble one another almost completely, and the common term *perianth* (q.v.) is then very generally employed. In some plants, the C. passes insensibly into the corolla, and it is not easy to distinguish the innermost sepals from the outermost petals. The C. is in such cases often composed of more circles of leaves than one. The C. occasionally falls off when flowering is over (*deciduus*), as in *ranunculus;* sometimes even when it commences (*caducous*), as in the poppy; generally it remains till the fruit is ripe (*persistent*), and is then much enlarged and more brightly colored, as in *physalis*. It often becomes fleshy, and forms the seeming fruit, as in the rose.—The glumes (q.v.) of grasses, etc., used to be regarded as a C., to which, however, they have no proper analogy.

CAM, or GRANTA, a river of England, which, rising in Essex, flows n.e. through Cambridgeshire, and after a course of about 40 m., joins the Ouse 3½ m. above Ely. It gives its name to the town of Cambridge, which stands upon it, and below which it is navigable, and is classic on account of the boat-races on it by Cambridge students.

CAM, in machinery, a curved plate or groove, by which motion is communicated and controlled. The moving plate or groove is a *driver;* the rod, bar, or other thing moved, is called the *follower*. The follower is held against the driver by its weight or by a spring, or other device. The radii of the driver determine by their length the motion of the follower, and the angles which they make with some one, chosen as a base of calculation, fix the time at which change of motion occurs. For example, it may be desired that the follower shall move upward, and then downward, with a uniform velocity. From the center of the driver any convenient number of radii may be drawn, dividing equally the 360° of angular space. On one of these radii we mark the distance from the center of the driver at which the point of the follower will stand when in its position nearest to that center. Upon the opposite radius, distant 180° from the first, the point is marked which gives the farthest position of the follower; the difference between these radii being divided into as many equal parts as we have made angular spaces in the 180°, we increase the length of each radius in succession, beginning with the shortest, by one of those parts, and we draw a curve connecting the ends of the radii so terminated. Of course the greater the number of parts chosen for the division of the angular space and of the difference of the first and last radii, the more accurately will the curve be drawn. The edge of the driving-plate being cut to this curve, the follower being made to press constantly against it, and the driver being turned with a uniform rotation, the follower will move through its limited space with an equable motion, because the radii of the driver increase by constant amounts, at constant intervals of time. If the curve is reversed, the second part being the symmetrical opposite of the first part, the follower will descend as uniformly as it rose. The cam thus drawn is one of frequent use, and is called the *heart-shaped* cam. To avoid friction the end of the follower often carries a roller which works against the surface of the cam; in this case the cam-surface is found by drawing a line parallel to that above described, at a constant distance equal to the radius of the roller. If we wish the follower to rest at any part of a cycle of motion, the radii for that time will be made equal, and the corresponding cam-surface will be a circular arc; the time will be such a part of that of a complete cycle, as the angle between the radii of the ends of this arc, is of 360°. The cam-plate has sometimes a groove cut upon its flat side, and the end of the follower runs in the groove. A spiral groove may be cut into the surface of a cylinder as in a screw; if a follower be inserted in this groove it will be driven forward as the cylinder turns; when the groove reaches the end of the cylinder, it may turn back, and cause the follower to return with the same motion, or if the pitch of the groove be made shorter or longer, the return of the follower will be changed accordingly. By a judicious construction and arrangement of cams, almost every variety of motion may be produced with the greatest precision as to time and amount. A cam-form which does not make a complete revolution, but after moving a short distance in one direction oscillates in the opposite direction, is called a *wiper*. A familiar example may be seen in the engine-room of a steamboat, in the rocking arms which raise and let fall the valve rods.

CAM, DIOGO, a Portuguese navigator of the 15th c., who continued the w. African discoveries commenced by Don Henry. He had sufficient influence with the king of Congo to induce that monarch to permit the establishment of Christianity in his dominion.

CAMAL'DOLITES, a religious order founded in the vale of Camaldoli, near Arezzo, in the Apennines, in 1018, by St. Romauld, a Benedictine monk, and a member of the noble family of the dukes of Ravenna. From Italy it spread into France, Germany, and Poland. The brethren, who wear a white garment, are, and have always been, characterized for the excessive rigidity of their monastic rule; but except to show to

what lengths in a cruel mortification of natural life man can proceed, they have been practically useless in the world. The order is now almost extinct.

CAMARGUE. See BOUCHES DU RHONE.

CAMARIL'LA, a Spanish word, diminutive of *camara*, literally signifies a little chamber. As *camara* is used to designate, *par excellence,* the chamber of the king of Spain, the royal chamber, so C. is also used to designate his private chamber or cabinet, the place where he receives his most intimate friends, courtiers, sycophants, and all the moral refuse that naturally gathers round a weak throne. Hence, in the political language of modern Europe, it has come to signify the influence exercised on the state by secret and unaccredited councilors, in opposition to the opinions of the legitimate ministry, an influence which in Spain particularly is most pernicious. The word first obtained this meaning in the time of Ferdinand VII., who was excessively addicted to the unkingly habit of listening to the insinuations of the companions of his pleasures.

CAMARI'NA, an ancient city of Sicily, near the mouth of the Hipparus, 20 m. e. of Terranova. It was founded by Syracusans in the 6th c. B.C., but soon after was destroyed, because it had thrown off its allegiance. It was restored 495 B.C., but again depopulated, being finally established about 34 years later. In 258 B.C., most of its people were sold by the Roman consuls as slaves. It continued to exist until the 2d c., but since then has been in ruins.

CAMAY'EU and MON'OCHROME are terms by which painting in one color is designated. The ancients painted thus both in gray (*en grisaille*) and in red. Pictures of several tints, but where the natural colors of the objects are not copied, are said to be *en camayeu.* As one color generally prevails, we speak of blue, red, yellow, green camayeu. Polidori Caravaggio, for example, so overlaid his other colors with brown, that his works give the impression of monochrome paintings. Drawings in Indian ink, red and black chalk, pencil, etc., as well as engravings, may be said to be *en camayeu.*

CAMBACÉRÉS, JEAN JACQUES RÉGIS, Duke of Parma, and high chancellor of the French empire, under Napoleon, was b. at Montpellier, Oct., 18, 1753. In 1791, he was appointed president of the criminal court in his native place. Afterwards, as member of the national convention, he took a prominent part in sketching the new code of laws, and distinguished himself by his moderation. He denied the right of the convention to condemn the king, and, when this was done, argued in favor of a reprieve. After the revolution of the 9th Thermidor (July 27, 1794), C. was elected president of the convention, and, as head of the committee of public safety, was active in procuring peace with Prussia and Spain. His enemies having succeeded in expelling him from office, he engaged himself in legal studies, and laid before the council of five hundred the sketch of a civil code which afterwards formed the basis of the *Code Napoleon.* In 1796, C. was for a short time made president of this council. After the changes made in the directory, he was made minister of justice, assisted in the revolution of the 18th Brumaire (Nov. 9, 1799), was made second consul, and faithfully attached himself to the interest of Napoleon, by whom he was raised to the office of high chancellor of the empire, and in 1808 was made duke of Parma. He endeavored to dissuade Napoleon from the projected invasion of Russia, but in this instance his advice was vainly given. In 1813, when Napoleon took the field against the allies, C. was left as president of the regency, and in this capacity accompanied the empress to Blois, 1814. From this place he sent to Paris his vote for the abdication of Napoleon. During the hundred days, against his own will, he was made minister of justice, and president of the chamber of peers. After the second restoration, C. lived privately in Paris for some time; but in 1816 was exiled for having taken part in the execution of Louis XVI. In 1818, his civil and political rights were restored, and he returned to Paris, where he lived retired to the time of his death, Mar. 5, 1824. Among the men of the revolution, C. was one of the few whose activity was peaceable and truly progressive. His services in the establishment of law were great. His nature was mild and candid, and his intellect very acute.

CAMBA'LUC, or CAMBALU' (Mongol, *Kaan-Baligh,* "city of the Khan"), the city now known as Peking. It was captured in 1215 by Genghis Khan, and in 1264 adopted as the imperial residence by his grandson Kublai, who founded a new city near the old one of Yenking. The new city, Ta-tu, or "great capital," was a rectangle about $5\frac{1}{4}$ by $3\frac{3}{4}$ m., or more than 18 m. in circumference, surrounded by a colossal wall of mud, having an inner inclosure for the palace and gardens of the khan. There were 11 gates, and the streets ran towards them in direct lines. It was the residence of the Mongol emperors until the fall of their power in 1368. Soon afterwards the native dynasty gave it the name of Pe-king, or "north court," by which name it was known to the early Jesuit missionaries; but now the native name in ordinary use is King-Cheng or King-tu, signifying "the capital." The restoration of Cambaluc was commenced in 1409; the size was diminished, and the town made more nearly a square, and in this form now constitutes the "Tartar city" of Pe-king. The walls were finished in 437. In 1544, the "outer city" was formed, the portion now known as "the Chinese city." The whole city under the name Cambaluc was made an archiepiscopal see by pope Clement V. in 1307.

CAMBAY′, a city, district, and gulf at the n.w. extremity of the peninsula of Hindustan.—1. C., the city, stands at the head of its gulf, and on the right bank of the Myhee, in lat. 22° 18′ n., and long. 72° 39′ e., being 76 m. to the n.n.w. of Surat. It contains about 33,700 inhabitants, having been at one time much more populous—ruinous palaces, mosques, and tombs, and an excavated temple of considerable pretensions, attest its former magnificence and extent. The main cause of its decay has been the gradual obstruction of its seaward navigation. It still exports grain, cotton, and ivory, besides its renowned manufactures in bloodstone and carnelian.—2. C., the district, contains an area of 350 sq.m., stretching in n. lat. from 22° 9′ to 22° 41′, and in e. long. from 72° 20′ to 73° 5′. It is attached to the presidency of Bombay, though under the government of a nawab of its own. Pop. 85,000.—3. C., the gulf, extends in n. lat. between 21° and 22° 10′, and in e. long. between 71° 50′ and 72° 40′, measuring 80 m. in length, and averaging 25 m. in breadth. In proportion to its size, it receives a vast quantity of fresh water—on the w., the Gooma, Oolowtee, Gelya, and Setroonjee; on the n., the Saburmuttee and Myhee; and on the e., the Nerbudda and the Taptee. The inundations of so many rivers, and the ebb and flow of tides, which fall and rise 30 ft., conspire not only to elevate the bottom, but also to generate movable quicksands.

CAM′BER, in ship-building, implies a slight arching or convexity upwards. A "cambered" ship is one in which the floor is higher in midships than at the stem and stern.—The name "camber" is also given to a small dock in a dockyard, for containing boats, and for loading and unloading timber.

CAMBERT, Robert, 1628–77; the first composer of French operas; organist of the church of St. Honore, and musical superintendent to Anne of Austria, the mother of Louis XIV. When Lulli was made musical superintendent to the king, in 1673, C. went to London, where Charles II. made him master of the band. His chief works were *Ariadne, or the Amours of Bacchus; Pomona;* and *The Pains and Pleasures of Love.*

CAMBERWELL, once a rural village, now a suburb of London, on the s. side of the Thames.

CAMBERWELL BEAUTY, *Vanessa antiopa*, one of the largest and most beautiful British butterflies, rare in Britain, although it has been found in many parts of the country, but common in the central and southern parts of Europe. The wings are of a deep brown color, with a band of black around the brown, and an outer band or margin of pale yellow, the black band containing a row of large blue spots, the yellow margin dappled with black specks, all the colors rich and velvety. The margin of the wings exhibits tooth-like angularities. The antennæ are terminated by a knob. The caterpillar feeds on the willow. It is black, with white dots and a row of large red spots down the back, and is rough with soft spines.—When Camberwell was more rural than now, and abounded in willows, this butterfly was sometimes taken there.

CAMBIO—CAMBIST. The former of these two words is the Italian for *exchange;* the latter, for a *money-changer.* Cambist is also used figuratively as the title of a book in which the moneys, weights, measures, etc., of various nations are given in the equivalents of some particular one. For instance, Kelly's *Universal Cambist* gives these in English, and the *Cambista Maltesa* in Italian.

CAMBIUM (Lat. *cambio,* to change), in botany, a layer of mucilaginous viscid matter, particularly abundant in spring, interposed between the woody layers and the bark of trees and other stems. Delicate cells (*cambium cells*) are formed in it, which certainly fulfill important functions in the formation of new wood, although, notwithstanding much investigation by some of the greatest vegetable physiologists of our time, the nature of these functions is still very imperfectly ascertained. The medullary rays are connected with the C. cells, and these cells gradually elongate into the shape which belongs to those of woody tissue. The C. layer is found only in exogenous stems.

CAMBO′DIA, or Cambo′ja (native name, *Kan-pou-chi*), an extensive country of the Indo-Chinese peninsula, now a protectorate of France, bounded on the s.w. by the gulf of Siam, on the s.e. by French Cochin-China, and on the n. by Siam. Area about 33,000 sq.m.; pop. about 900,000. The surface is mostly flat, and the soil fertile. There are extensive forests, which shelter elephants and deer; there are also wild cattle and ponies, and the rhinocerous abounds. Among the chief products are rice, betel, arecanuts, gamboge, spices, sandal-wood, and ivory. Iron occurs. See Cochin-China.

CAMBO′GE. See Gamboge.

CAMBON, Joseph, 1756–1820; a French financier. He was a member of the national convention of 1792 and of the committee of safety of the next year; and in 1794 promoted the downfall of Robespierre. He is credited with having laid the foundation of the financial system of France. In 1816 he was exiled.

CAMBORNE, a t. of Cornwall, 11 m. n.w. of Falmouth. It is surrounded by very productive copper, tin, and lead mines. C. church has a stone inscription of the 10th century. Pop. '71, 7757.

CAMBRAI, a city of France, in the department of the Nord, about 32 m. s.s.e. of Lille. It is situated on the right bank of the Scheldt, is strongly fortified and well built, with tolerably wide, but irregular streets, and many picturesque old houses. The

cathedral, archiepiscopal palace, town-house, and theater are among the principal public buildings. The city was greatly injured in 1793, when the revolutionists, among other vandalisms, razed the fine cathedral. They also disentombed the remains of Fénélon, who was archbishop here, and melted his lead coffin into bullets. A monument, however, by David the sculptor was erected (1825) in the new cathedral, in memory of the immortal author of *Télémaque*. The manufactures of the city are important, consisting of cambric—so called from its manufacture here—linen-thread, lace, cotton-yarn, beet-root sugar, soap, starch, leather, etc. It has also a trade in agricultural produce. The pop. in 1876 was 16,966.

C. was known to the Romans under the name of *Camaracum*, and it was then one of the chief cities of the Nervii. It was fortified by Charlemagne, and was long governed by its own bishops, to whom Charles the Bald ceded it. The celebrated league against the republic of Venice, which comprised the pope, the emperor of Germany, and the kings of France and Spain, was entered into here in 1508, and takes its name from the city. Here also were concluded treaties between the French king and the German emperor in 1529, and in 1724–25, between Charles VI. and Philip V. of Spain. During 1815–18 it was the head-quarters of the British army of occupation.

CAMBRIA, a co. in s.w. Pennsylvania, drained by affluents of the Susquehanna and Alleghany rivers, and intersected by the Pennsylvania railroad; 670 sq.m.; pop. '80, 46,824. It is a high and broken table-land, with abundance of coal and iron. Agriculture is the chief business. Co. seat, Ebensburg.

CAM'BRIA, the ancient name of Wales, the Britannia Secunda of the Romans. The name is derived from that of Cimbri or Cymri, by which the Welsh have always called themselves. See BRETTS AND SCOTS.

CAMBRIAN ROCKS, the name given by prof. Sedgwick to the oldest known fossiliferous rocks, on account of their extensive development in North Wales. Their true limits have been the subject of considerable controversy. When Sedgwick first described them, they were considered inferior to the Silurian measures. Subsequent examination has shown that they are the equivalents of rocks previously described by Murchison as lower Silurian; and accordingly geologists generally, following the classification of the government geological surveyors, confine the term to an extensive series of gritstones, sandstones, and slates, which underlie the Silurian lingula beds. In Anglesea these rocks have been metamorphosed in one place into chlorite and mica schists; in another, into gneiss, and all traces of organisms have been destroyed. In North Wales they are less altered, but have as yet proved unfossiliferous. In the Longmynd (Salop), there is an apparent thickness of 26,000 ft., which may be, however, owing to folds in the beds. A few fossils have been noticed here, consisting of a fucoid plant or two, the tracks of annelids, and the fragments of a supposed trilobite, called *palæopyge ramsayi*. In Ireland, similar rocks occur, containing two species of a small branched zoophyte, named *oldhamia*, and numerous tracks and burrows of sea-worms.

CAMBRIAN SYSTEM (CAMBRIAN ROCKS, *ante*), rocks belonging to the primordial division of palæozoic time, and comprising the oldest part of the lower Silurian age, appears on the American continent in Newfoundland, Nova Scotia, New Brunswick, Canada, northern New York, Vermont, eastern Massachusetts, the Appalachian mountains, many parts of the Mississippi valley, and under the secondary and younger palæozoic rocks of the Rocky mountains. They are divided by American geologists into the Acadian and Potsdam groups: the former are the oldest of American primordial rocks, and contain a mass, 2000 ft. deep, of gray and dark shales with some sandstones; the latter, also in part sandstone, has in Newfoundland a depth of 5600 ft., but in the valley of the St. Lawrence diminishes to 600 and even 300 feet. The sandstone beds contain ripple marks, mud cracks, layers indicating the wind-drift, and ebb and flow structure, and animal tracks. The Acadian formation yields primordial trilobites of the genera *paradoxides conocoryphe, agnostus*, and some others; brachiopods of the genera *lingulella, discina, obolella*, and *orthis;* and several kinds of annelide tracks. The Potsdam rocks contain a few sponges, the earliest forms of graptolite, some brachiopods, including, besides the genera in the Acadian beds, *obolus, camarella*, and *orthisina;* some pteropods, (*hyolites* or *theca*); two species of *orthoceras;* annelide tracks; trilobites of the genera *conocoryphe, agnostus, dikelocephalus, olenellus, ptychaspis, chariocephalus, aglaspis*, and *illænurus*. Barrande found a remarkable uniformity in the organic remains of those parts of this system which he investigated, extending through Europe and America, and named by him the primordial zone.

CAMBRIC, a general term applied to the finest and thinnest of linen fabrics. It is said to be derived from Cambrai, where such goods were first made. Some of the finest cambrics of the present day are produced in Switzerland. Scotch C. is really a muslin, being made of cotton with the fiber twisted very hard, to imitate real or linen cambric.

CAMBRIDGE, a t. in the state of Massachusetts, on the Charles river, 3 m. to the n.w. of Boston (q.v.). Here, in 1638, within eighteen years after the landing of the Pilgrim Fathers, was founded Harvard university by the Rev. John Harvard, who bequeathed it a legacy of about £780, and which has gradually been endowed to the amount of

1,000,000 dollars, so that its vested income must be at least 60,000 dollars or £12,000. The oldest, it is also generally considered the best, institution of the kind in America. In addition to the collegiate department proper, the university includes a theological, law, scientific, and medical school, and a department for such as wish to prepare themselves for business avocations without going through a classical course. In 1875, the students amounted to 1161. The town of C. is rapidly advancing in population, the census in 1830, 1840, and 1850 respectively having been 6072, 8409, and 15,215; that of 1870 was 39,634. In 1874, the pop. was 50,337.

CAMBRIDGE (*ante*), a city, and one of the co. seats of Middlesex co., Mass., w. of Charles river, which separates the township from the city of Boston, of which C. is practically a part, as Brooklyn is of New York. There are four principal divisions, North, East, Old Cambridge, and Cambridgeport; pop. '80, 52,740. The city spreads over a large extent of territory, and is handsomely laid out in broad avenues with abundance of shade trees, among the most interesting of which is the elm under which Washington assumed command of the revolutionary forces in 1775. The house in which Washington dwelt is now the residence of Longfellow, the poet. The modern residences are generally surrounded with handsomely cultivated grounds, orchards, and flower and fruit gardens. The main feature of C. is Harvard college (q.v.), the buildings of which are in Old C., 3 m. from Boston, occupying a plot of 14 acres handsomely laid out and shaded with ancient elms. At a little distance n.e. of the college are the museum of comparative zoology, founded by Agassiz, the botanical garden, and the observatory, noted as possessing one of the best telescopes in the country. Near the museum are the Harvard law school and the Lawrence scientific school. Another conspicuous building is Memorial hall, erected to the memory of Harvard students and graduates who fell in the war of the rebellion: this is probably not exceeded in grandeur by any college hall in the world. It presents three apartments—a memorial vestibule, the Sanders theater for great academic assemblies, and a dining-hall with accommodation for 1000 persons. The whole structure is 310 ft. long by 115 ft. wide, with a tower 200 ft. high. There is also a granite monument near the college erected by the city in honor of the fallen soldiers. C. also contains Mt. Auburn, one of the most beautiful cemeteries in the world. It occupies 125 acres of hill and valley, laid out in a charmingly picturesque manner, while the monuments show a great variety of taste and munificence. This is the oldest of the splendid burial places in the country, having been dedicated in 1831. Bridges over Charles river connect C. with Boston, Brighton, and Brookline. Horse railroads connect with all adjacent towns, and the Boston and Lowell and the Fitchburg railroads pass through East Cambridge. The streets are well drained, and lighted with gas. C. is not a business place, but rather a home for the business people of Boston. Still there are manufactories of locomotives, steam-engines, glass, carriages, marble, chemicals, brushes, biscuit, candles, soap, chairs, cabinet ware, etc. The Riverside press and the university printing-office, are noteworthy; the last named is the oldest printing establishment in the country. C. has a regular city government, vested in mayor, aldermen, and common councilmen, with the usual executive and judicial courts and functionaries. Water is supplied from two large lakes in the neighborhood, and stored in large reservoirs. Under the influence of the college the schools of the city are of a high order, and to these are added the Dana library and free lectures at the Dowse institute. There are in C. three or four newspapers and about 30 churches or congregations. The first settlement here was in 1630, and was called Newtown, and Winthrop and others intended it to be the chief town in the colony. The first minister, Rev. Mr. Hooker, was settled in 1632. In 1636, money was voted to establish a public school, which was further aided by grants from the Rev. John Harvard of Charlestown. The city charter of incorporation was granted in 1846.

CAM'BRIDGE, the chief t. of the co. so named, lies 48 m. n.n.e. of London. It takes its name from the river Cam, which was anciently called the Granta. By the Saxons, C. appears to have been known as Grantabrycge, which is found with many slight variations of spelling, and probably became abbreviated into Cantbricge. It is also supposed that C., and not the adjacent village of Grantchester, was the Grantaceaster of the Saxons. There are, however, traces of a camp at Grantchester. In 870, the Danes ravaged the country hereabouts, and are said to have destroyed the town. King John, in the second year of his reign (1200 A.D.), granted a charter to the town, permitting it to have a guild of merchants, and in 1207, confirmed the burgesses in their privileges in perpetuity. In 1225, they paid a fine of 50 marks for having their liberties; and in 1227, Henry III. confirmed their charters. The town has sent two members to parliament from the earliest period. The university sends two members of its own. The pop. of the municipal borough in 1881 was 35,363, that of the parliamentary borough, 40,878. C. has 18 churches belonging to the church of England, besides chapels belonging to the Baptist, Congregationalist, and other bodies. The most curious church is that of the Holy Sepulchre, which is one of the few in England that have a round tower. The town is not generally pretty or picturesque, but the gardens at the backs of the colleges, by the Cam, are extremely beautiful in the summer months. Its architectural features depend chiefly on the college and university buildings.

CAMBRIDGE, Adolphus Frederick, Duke of, 1774–1850; youngest son of George III., and uncle of queen Victoria. He served as an ensign in the army, and was educated afterwards at Göttingen, returning home in his 20th year. In the Netherland campaign of 1793, he was taken prisoner by the French, but was almost immediately exchanged. Thereafter most of his public duty was in Hanover as governor and viceroy, until the separation of Hanover from the British crown in 1837, when he returned to England, mixing no further in public affairs.

CAMBRIDGE, George William Frederick Charles, Duke of, b. 1819; field-marshal and commander-in-chief of the British armies; first cousin of queen Victoria, son of Adolphus Frederick, duke of Cambridge; succeeded to his title July 8, 1850. In 1837, he was col., and in 1854, lieut.gen. commanding the first division sent in aid of Turkey against Russia. He led the troops at Alma and at Inkerman. In consequence of ill health he returned to England, and in 1856 succeeded viscount Hardinge as commander-in-chief; in 1862, he was given the rank of field-marshal The duke has never married, but for many years has lived with Miss Fairbrother, once known as a beautiful actress, by whom he has several children.

***CAMBRIDGE**, University of, one of the two ancient institutions of the kind existing in England. Overlooking several fabulous accounts of its origin, its true history may be said to begin at the opening of the 12th century. It was in 1110 that Joffrid, abbot of Croyland, sent over to his manor of Cottenham, near Cambridge, Gislebert, his fellow-monk and professor in divinity, with three other learned monks. These came over to Cambridge, and in a hired barn taught their sciences, and in a short space of time drew together so great a number of scholars, that in the second year of their coming no single building was able to contain them. Perhaps even this statement is doubtful. At any rate, when Alfred of Beverley was student here—viz., 1129 A.D.—there were as yet no public halls or hostels, but each one lived in his own hired lodging.

The first regular society of students was that of Peterhouse, founded in 1257. About this time, students began to live together in hostels, under the rule of a principal, at their own charges. These hostels were named after the saints to whom they were dedicated, the churches which they adjoined, or the persons who formerly built or possessed them. In the year 1280, there were as many as 34, and some of them contained from 20 to 40 masters of arts, and a proportionate number of younger students; but all these hostels decayed by degrees when endowed colleges began to appear. Trinity hostel survived all the rest, and continued to 1540. The hostels were the beginning of what may be called the *college system*, which distinguishes the sister-universities of Oxford and Cambridge from those of Edinburgh, London, and the continent. See Universities.

It was between the latter part of the 13th and the close of the 16th c. that all these royal and religious foundations were endowed which now constitute the university. Hugh de Balsham has the honor of being the first benefactor in this way. Michael house was founded by Hervey de Stanton in 1324, and King's hall by Edward III. in 1332, both of which were absorbed into Trinity college by Henry VIII. in 1546. Clare hall, as it used to be called, one of the earliest and now one of the prettiest colleges in Cambridge, was founded by the countess of Clare in 1326. Henry VI. has left himself an imperishable monument in the splendid foundation of King's college; and his queen, Margaret, commenced the foundation of Queens' college, which was added to by Elizabeth Widville, queen of Edward IV. Lady Margaret, countess of Richmond and Derby, mother of Henry VII., founded Christ's college and St. John's at the beginning of the 16th c., and also the divinity professorship named after her. Henry VIII. appropriated part of the spoils of the monasteries to the foundation of Trinity college, and queen Mary augmented the endowment. The five regius professorships were endowed by Henry VIII. Cambridge was frequently visited by the plague, and university proceedings were suspended by it in 1642 and 1666. In 1643, Cromwell took possession of the town, and the most eminent loyalists were expelled from the university. Almost all the colleges had sent their plate to the king at Nottingham. As might be expected, little was done for the university in this troubled century; indeed no new colleges were added until the founding of Downing college in 1800.

The predominance of the religious element in the college discipline is to be attributed as much to the circumstances and manners of the times in which the colleges were founded, as to the piety of the founders themselves. There had been, from very early times, "religious houses," and these were in many cases united with the new collegiate foundations. There were, for example, the Dominicans, or preaching friars, whose house is now turned into Emmanuel college. The friars who lived in these convents were capable of degrees, and kept their "acts," or exercises for degrees, as other university men. There were, however, frequent quarrels between them and the other students. To the same cause is to be traced the condition of celibacy, upon which, with few exceptions, the fellowships were formerly tenable. Masters of colleges and professors may all marry, and the restriction in the case of fellows has lately been removed or relaxed at most of the colleges. In like manner, the obligation to take holy orders as the condition of holding a fellowship, has been greatly relaxed at all the colleges. At St. Peter's there are 11, and at Trinity hall 10 lay fellowships.

The present university statutes were confirmed by queen Victoria, by order in council, July 31, 1858. The governing body is the senate, and the building where they meet is called the senate-house. All university laws are approved by an elected body called the council, before they are submitted to the senate. The executive powers are intrusted to a chancellor, high-steward, vice-chancellor, commissary, and assessor. The public orator is the voice of the senate upon public occasions. The proctors superintend the discipline and morals of all persons in *statu pupillari;* they are present at all congregations of the senate, read the "graces," and take the votes. The registrary is responsible for the graces being offered in due form, and has charge of the university records. There are three terms in this university—the Michaelmas or October term, the Lent term, and the Easter term. To take an ordinary B.A. degree, a student must reside nine terms. The M.A. degree follows four years after. Dissenters are not excluded by the terms of the new statutes from taking degrees, except in divinity.

With respect to the admission of students, their university course, expenses, and proceedings in degrees, the following information may be useful: There are four classes of students—viz., *fellow commoners* and *noblemen*, *pensioners*, *sizars*, and the more distinguished students who are elected *scholars* on the foundation of their college. The first class are so called from their dining at the fellows' table; they wear silk or embroidered gowns, and pay heavier fees. The pensioners are the great body of students who are not on the foundation, and who pay for their own commons, viz., dinners in hall, etc., and for their chambers. The sizars are the poorer students, who are admitted at lower charges than the pensioners, but wear the same dress, and are no longer subject to the performance of menial offices as they once were. Some of the colleges, especially St. John's and Trinity, have very liberal endowments for the sizars, and very considerable pecuniary assistance is given to the more deserving of them, so that no youth of real ability, industry, and good character, need be deprived by poverty of the advantages of a university education. Non-collegiate students have lately been admitted to the university under special rules. The scholars are elected, by examination, from the pensioners and sizars; they are on the foundation of the college, have rooms and commons free, and other emoluments. The fellows are subsequently elected from the scholars and the students who have distinguished themselves in the tripos examinations. Vacancies are, as a rule, filled up from members of the college, but many fellowships are open to the competition of the whole university. The usual age of admission is from 17 to 20. Before a student can be admitted, he must obtain a certificate from some master of arts of the university of being sufficiently instructed in Latin, Greek, and mathematics; this certificate must be sent to the tutor of the college, along with the caution-money, which, in the case of a pensioner, amounts to £15. At some colleges there is an examination previous to matriculation in addition to the above.

Residence is commenced in the October term. It is usual, particularly at the larger colleges, to have the name entered on the college boards for a term or two previous; but this is not necessary now, as it used to be, in order to *keep* such terms with a view to the degree. When the undergraduate comes into residence, he is called a "freshman;" in his second year, a "junior soph;" in his third year, a "senior soph." The ordinary B.A., or bachelor of arts degree, may be taken in the ninth term of residence—viz., in the third June after coming up. The subjects of examination are partly fixed, partly variable. They are the Acts of the Apostles in Greek, one Greek and one Latin classic, *The History of the English Reformation; Euclid*, books i., ii., iii., iv., and propositions 1–6 of book vi.; together with certain parts of algebra, mechanics, and hydrostatics. The candidates for examination for degree are called questionists.

Candidates for mathematical "honors" do not go up till the end of their tenth term —i.e., the Christmas three years after coming up. The examination embraces the whole range of pure mathematics, and mathematics as applied to natural philosophy. The successful candidates are arranged in a tripos—i.e., in three classes, called respectively wranglers, senior optimes, and junior optimes; the first mathematician of the year is called the senior wrangler. The Smith's prize examination for the best mathematician sometimes reverses the decision of the tripos.

The examination for classical "honors" is one term later still, and the candidates are arranged in a tripos, and distinguished as first, second, and third class. Very accurate scholarship is required to obtain a good place in this tripos. The examinations for degree are called "great go." The previous examination, which comes in the second year of residence, is called "little go." Students who intend to graduate in classical honors, are required to take mathematical honors in little go. The previous examination is one Greek and one Latin author, one of the gospels in Greek, Paley's *Evidences of Christianity*, and elementary mathematics. After passing the "little go," the examinations for the ordinary B.A. degree consist of a "general" and a "special" examination, the subjects in the former being similar to those in the little go. The special examination is, at the option of the student, in theology, moral or natural or applied science, or law. The following are the professors: Regius professors of laws, physic, Greek, Hebrew, and divinity, professor of moral philosophy, professor of chemistry, professor of anatomy, professor of modern history, professor of botany, professor of geology, Jacksonian professor of natural philosophy, Downing professors of law and medicine, professor of mineralogy, professor of political economy, professor of archæol-

ogy, professor of music, a lady Margaret, a Hulsean, and a Norrisian professor of divinity, two Arabic professors, a Sadlerian and a Lucasian professor of mathematics, a Lowndean and a Plumian professor of astronomy, Slade professor of fine art, professors of Latin, Sanscrit, international law, zoology, experimental physics, and mechanism. Degrees in honors are given in law and in natural and moral science, without requiring further proficiency in the normal studies of the place, classics and mathematics, than is ascertained by passing the little go. The fees for the different degrees will all be found in the *Cambridge Calendar*. There are different fees at the different colleges in addition to the university fees. It will be sufficient to state, that for the B.A. and M.A. degrees, the fees amount to about £12 and £25 respectively.

The great prizes at the university are the *fellowships*, of which there are about 400, some open to all candidates without restriction, but conditions of tenure as to marriage and holy orders vary at different colleges. Their value varies from £100 to £300 per annum, and the senior fellowships are often £500 or more. There are also stipends attached to all the college offices—e.g., those of dean, bursar, steward, etc. The office of tutor is one of great honor and emolument. The chancellor gives annually two gold medals, open to the competition of all students qualified to be candidates for the classical tripos of the year. The members of parliament for the university give annually four prizes for the best dissertations in Latin prose. There are numerous other university distinctions, both scholarships and of other kinds, for an accurate account of which the *Cambridge Calendar* should be consulted. See, also, CAMBRIDGE, UNIVERSITY OF, *Supp.*

The following is a list of the colleges in the order of their antiquity. A particular notice of each college (including Selwyn) will be found in its alphabetical place:

Name.	Founded.	Undergraduates in 1883.
St. Peter's college, or Peter-house	1257	50
Clare college	1326	112
Pembroke college	1347	114
Gonville and Caius college	1348	147
Trinity hall	1350	207
Corpus Christi, or Benedict college	1351	107
King's college	1441	61
Queens' college	1448	51
St. Catharine's college or hall	1473	48
Jesus college	1496	159
Christ's college	1505	139
St. John's college	1511	330
Magdalene college	1519	56
Trinity college	1546	449
Emmanuel college	1584	73
Sidney Sussex college	1598	31
Downing college	1800	66
Cavendish college	1876	71

Students whose names are not on the boards of any college, and are allowed to pursue their studies and proceed to degrees, were 210 in number in 1881.

Few of the colleges present an imposing façade to the streets—King's is, perhaps, the only one of which this may be said—but the quiet and picturesque beauty of the courts in the interiors is very pleasing. Dr. Whewell, the late master of Trinity college, built a new hostel in connection with Trinity, which is considered to be in very good taste. Amongst the other public buildings of Cambridge are to be mentioned the senate-house, where university examinations are held, degrees conferred, and all public business of the university conducted. The Fitzwilliam museum is the finest of the modern additions to the university. Viscount Fitzwilliam bequeathed, in 1816, £100,000 South-sea annuities, the interest of which was to build and support a museum. He left also a very valuable collection of books, paintings, etc., as a nucleus for future contributions. G. Basevi was the architect. The university library is a fine mass of buildings of different periods, and contains at present more than 200,000 volumes. The geological museum contains the original collection of Dr. Woodward, which, out of respect to the founder, has been kept in its original state, unmixed with more recent and vastly more numerous and interesting acquisitions. The university is indebted for many of these geological treasures to the late prof. Sedgwick. The mineralogical room contains the valuable collections of the late sir A. Hume, Charles Brooke, and Henry Warburton. The Pitt press is a Gothic structure built in honor of Mr. Pitt, who was educated at Cambridge. It contains the university printing-offices, which are very extensive. There is also a good anatomical museum.

There is a very good hospital, founded under the will of Dr. Addenbrooke in 1753. The observatory contains some very fine instruments, amongst which is a large equatorial telescope, presented by the duke of Northumberland in 1835. The income of the university is about £2000, and the aggregate income of the colleges about £200,000 per annum.

For the most recent information about the university studies, etc., the Cambridge

Calendar for the current year should be consulted; for the history, biography, and antiquity, see Fuller's *History of Cambridge;* Dyer; Caius; Le Keux' *Memorials;* Cooper's *Annals;* Cooper's *Athenæ Cantabrigienses; Graduati Cantabrigienses.*
See *Supp.*, page 886.

CAMBRIDGE PLATFORM, the system of church discipline agreed upon by the representatives of the New England churches at the synod held in Cambridge in 1648. In regard to doctrine they adhered substantially to the Westminster confession, though they did not impose that on the churches; but they did not accept that confession which was Presbyterian with respect to church order and polity, for regulating which they constructed the Cambridge platform, which declares that the form of church government is one and immutable, and prescribed in the word of God. According to this platform, the church in general consists of the whole company of the redeemed; but the state of the visible church militant was before the law economical, or in families; under the law, national; and since Christ, only congregational, or in local companies. In number a church ought not to be greater than may ordinarily meet together conveniently in one place, nor fewer than can conveniently carry on church work. The supreme power of the church belongs to Jesus Christ, who deputes extraordinary power to apostles, etc., and ordinary power to every particular church; officers are necessary to the well-being but not to the being of a church. Extraordinary officers, as apostles, are temporary; the ordinary, which are bishops (the same as elders or pastors) and deacons, are perpetual. A deacon's official acts are confined to temporal affairs. Any church may elect and depose its own officers, but in so doing the advice of neighboring churches should be sought. Ordination is the solemn putting a man into his office; it follows his election. In respect to Christ, the head, the church is a monarchy; in respect to the body or the brotherhood, it is like a democracy; in respect to the presbytery, or company of ministers, it is an aristocracy. Synods, though not necessary to the being, are useful to the well-being of the churches; but synods are not permanent ecclesiastical bodies. It is declared that local churches are of right distinct, equal, self-governed under Christ; yet that they should be gathered and should proceed in communion with each other; which communion they are to exercise by mutual care, by consultation, by admonition, by sharing in acts of worship, by needful transfer of members, by relief and succor. Synods have not power of church-censure and discipline, but are to declare the principles on which such acts are based, and their decisions are to be submitted to if found consonant with the word of God. The platform deals also, as its date required, with the relation of civil magistrates to affairs ecclesiastical. The platform is accepted and largely followed by the congregational churches as a useful guide, and as a strong presentation of the principles of church order given in the New Testament; but its enforcement upon any church as an authoritative rule would of course be attempted in vain.

CAMBRIDGESHIRE, an inland co. of England, in lat. 52° 1′ to 52° 45′ n., long. 0° 31′ e., and 0° 16′ west. Its greatest length, from n. to s., is about 50 m., and its breadth 30 m., with an area of 820 sq. miles. Pop. '81, 185,594. About three fourths of the co. consists of arable land, meadow, and pasture, the rest being fens. The surface of C., except in the s., which is somewhat elevated and on the chalk formations, is marshy and flat, thinly wooded, and with villages and churches here and there on slight elevations, called "eys" or islands. The upper greensand, which in some places near Cambridge comes to the surface, yields in rich abundance the curious fossils miscalled coprolites (q.v.), which are of great value as an artificial manure. Their value is in some places equal to that of the land itself. The northern part of C. forms part of the Bedford level. The chief rivers are the Ouse, which crosses the middle of the county from w. to e., with its tributary the Cam; the Nene, which borders the co. on the n.; and the Lark. These are all navigable to a certain extent. C. is an agricultural county. In the higher parts, the land produces fine crops of beans and wheat. Many cattle and sheep are now supported on the thin, chalky soils. The black spongy soil of the fens consists of mud mixed with decayed vegetable matter, and, when drained and burned, produces, in dry years, heavy crops of cole-seed, wheat, oats, barley, hay, potatoes, hemp, and flax. Horses, cattle, sheep, and pigeons are also reared in the fens. The isle of Ely, part of the fen-tract, and within the Bedford level, is famed for garden vegetables; and the meadows of the Cam yield fine butter and cream-cheese. The chief towns of C. are Cambridge, the co. town; Ely, Wisbeach, March, Thorney, Linton, Soham, Newmarket, and Royston. The manufactures of C. are mostly such as belong to an agricultural county. There are paper and parchment mills, and coarse earthenware is manufactured. Needle-making is also carried on to some extent. C. returns 3 members to parliament. This co. was anciently the seat of a powerful tribe—the Iceni. It was crossed by several British and Roman roads, in some parts now covered by several feet of peat-soil. Remains of Roman camps, sea-embankments, and villas, occur, and Roman antiquities, as coins and urns, have been found. There are some ancient—supposed pre-Roman—ditches miles in length. One of these, the Devil's ditch, with an elevated vallum, having a slope of 52 ft. on one side and 26 ft. on the other, is about 100 ft. broad. In the 9th and 10th c., C. was the scene of severe contests between the Danes and Saxons. The isle of Ely and its monks withstood William the conqueror for 8 years. C., and especially the isle of Ely, suffered much in the civil wars of Stephen,

John, Henry III., and Charles I. There formerly existed 36 religious houses in Cambridgeshire. Since Charles I.'s time, much fen-land has been reclaimed by embanking rivers and cutting new channels.

CAMBRONNE, Pierre Jacques Etienne, 1770–1842; a French general of great renown for daring bravery, and a devoted servitor of Napoleon, whom he accompanied to Elba. He was in command of the imperial guard at Waterloo, and when entirely surrounded, and the battle utterly lost, he contemptuously refused to surrender, but fought until literally cut down. He was nearly killed, but lived to go to London, where he heard that in France he was charged with an attack upon his own country, to answer which he at once went to Paris and demanded a trial. This was granted, and he was honorably acquitted, and after the revolution of July he was restored to his rank in the army.

CAMBUSLANG, a parish and mining village in Lanarkshire, celebrated in the revivals of 1741. See Whitefield.

CAMBY'SES, second king of the Medes and Persians, was the son of Cyrus and Cassandane, and succeeded his father in the monarchy, 529 B.C. C. is the Greek form of his name, the ancient Persian name is Kabujiya. In 525 B.C., C. invaded Egypt, defeated Psammenitus, the king of Egypt, at Pelusium, and in six months made himself master of the whole country. He meditated further conquests, but was not permitted to carry his designs into effect; the Tyrians, upon whom his maritime power depended, refused to serve him against the Carthaginians; an army which he sent to take possession of the temple of Jupiter Ammon, perished in the desert; and one which he led in person against the Ethiopians, was compelled to return from want of provisions. C. now addicted himself to excessive intoxication, and perpetrated horrid cruelties in Egypt; the accounts of which, however, depending upon his enemies the Egyptian priests, are doubtless exaggerated. It is probable, however, that his tendency to epileptic fits, along with the arbitrary disposition induced by success and power, caused him to indulge in violent and capricious acts of tyranny. The Egyptians believed him to be mad. A pretender to the Persian throne having appeared, C. marched against him, but died on the way in Syria, 521 B.C.

CAMDEN, a co. in s.e. Georgia, on the ocean and the Florida border, n. of St. Mary's river, and including Cumberland island in the Atlantic; 600 sq.m.; pop. '80, 6183—4092 colored. It is level, with sandy soil, rice being the chief production. Co. seat, Jeffersonton.

CAMDEN, a co. in central Missouri, on the Osage river, and touched by the Atlantic and Pacific railroad; 600 sq.m.; pop. '80, 7267—115 colored. It has lead mines, and an undulating surface, and tolerably fertile soil, producing tobacco, corn, wheat, etc. Co. seat, Lynn Creek.

CAMDEN, a co. in s. w. New Jersey, e. of Delaware river, traversed by five railroads, all centering at Camden, the chief town, opposite Philadelphia; 220 sq.m; pop. '80, 62,941. Surface mostly level and fruitful, producing grain, butter, milk, vegetables and fruits for city markets. Co. seat, Camden.

CAMDEN, a co. in n.e. North Carolina, n. of Albemarle sound and e. of Pasquotank river; 280 sq.m., a portion of which is in the Dismal Swamp; pop. '80, 6274—2483 colored. The Dismal Swamp canal extends in this county to the Pasquotank at South Mills. Productions—corn, sweet potatoes, and cedar and cypress timber. Co. seat, Camden Court-House.

CAMDEN, the seat of justice in Wilcox co., Ala., 33 m. s.w. of Selma; pop. '70, 3060—2225 colored. The village is on an eminence 4 m. from the Alabama river, and is the center of an important trade. Pop. '80, 3795.

CAMDEN, the seat of justice of Ouachita co., Ark., 82 m. s.w. of Little Rock, at the head of navigation on the Ouachita river, in a good situation for trade; pop. '70, 1612—612 colored. The place was formerly a rendezvous for hunters. Pop. '80, 1503.

CAMDEN, a city of New Jersey, U. S., on the left bank of the Delaware river, opposite Philadelphia, with which it is connected by 4 steam-ferries. It is the terminus of the Camden and Amboy, Camden and Atlantic, and West Jersey railways. It has a court-house, 2 banks, 2 railway depots, 15 churches, ship-yards, iron-works, foundries, manufactories of machinery, etc. Pop. '70, 20,045.

CAMDEN (*ante*), a city in New Jersey, opposite Philadelphia, 87 m. from New York, and an important railroad and shipping point; pop. '80, 41,658. The streets are on the rectangular plan, but wide, and the city shows many fine buildings, including the railroad depots, opera house, etc. There are iron foundries, chemical works, and some other manufactories. C. was chartered as a city in 1831.

CAMDEN, in Kershaw co., S. C., 102 m. n.w. of Charleston, at the terminus of the C. branch of the S. C. railroad; pop. '80, 1780—555 colored. Two battles were fought in the vicinity in the war of the revolution; the first on Aug. 16, 1780, when the English commander Cornwallis defeated Gates and the revolutionary forces, mortally wounding baron De Kalb; and a less important engagement a year later, when Greene and the Americans were repulsed by the English under Rawdon. In 1825, a monument

was erected at Camden to the memory of De Kalb, the corner-stone of which was laid by Lafayette.

CAMDEN, a co. in s.e. New South Wales, Australia, on the Pacific ocean; 2200 sq.m.; pop. '66, 22,734, but now much larger. It is the largest grain-producing county in the colony; has iron mines, and vast herds of cattle. Capital, Berrima.

CAMDEN, Me. See page 887.

CAMDEN, CHARLES PRATT, Earl of, a younger son of sir John Pratt, chief justice of the court of king's bench in the reign of George I., was b. in 1714. Educated at Eton and Cambridge, he studied for the law, and was called to the bar in 1738. Not until 1752, however, when he defended a bookseller successfully against a government prosecution for libel on the house of commons, did C.'s prospects appear very promising; from this time his success was certain. In 1757, he was appointed attorney-general, and four years afterwards, accepted a seat on the bench in the court of common pleas. Judge in the trial of Wilkes, he declared his opinion emphatically that the action of government in this case, by general warrants, was altogether illegal—an opinion which, chiming in with public sentiment at the time, made him the most popular of judges. In 1765, he was created baron C. of Camden place, Kent, by the Rockingham administration; to whose American policy, and to their treatment of Wilkes, notwithstanding, he offered constant opposition. The following year, when he was made lord chancellor, he did not abandon his principles; and four years after—the duke of Grafton being then prime minister—he supported an amendment made by Chatham on the government address, and resigned his place. His judicial career ended here; henceforth, he was entirely a political character, and for more than 20 years took an active part against the ill-advised American policy pursued by lord North, and in discussions on the law of libel, in which he maintained the popular view. As a judge, he is held in high estimation, though his manner was somewhat undignified. He filled the office of president of the council in the Rockingham administration in 1782, and also from the following year until his death, under Pitt. He died April, 1794.

CAMDEN, JOHNSON N. See page 887.

CAMDEN, WILLIAM, one of the most distinguished scholars and historians, and the most laborious and painstaking antiquary of the 16th c., was b. in London, where his father was a paper-stainer, in May, 1551. His education, commenced at Christ's hospital, was completed at St. Paul's school, and at Oxford. In 1575, he was appointed second-master of Westminster school; and it was while discharging the duties of this office that he undertook the work which has made his name famous, his *Britannia*, giving an account of the British Isles from the earliest ages, which, written in elegant Latin, was first published in 1586. It at once brought him into communication with the learned men of his time. Before 1607, the work had passed through six editions, being greatly enlarged and improved by the indefatigable industry of the author. The book, at first but a comparatively small single volume, has received much additional matter from other writers. The best known edition of C.'s *Britannia*, is that of Edmund Gibson, in English, 2 vols. fol. Of this great work of C., bishop Nicolson said it was "the common sun whereat our modern writers have all lighted their little torches." In 1593, C. was appointed head-master of Westminster school; and four years later, he was made clarencieux king-at-arms, an appointment which gave him more time for the pursuit of his favorite studies. His other most important works are—*Annals of the Reign of Elizabeth; A Collection of Ancient English Historians; An Account of the Monuments and Inscriptions in Westminster Abbey;* and a *Narrative of the Gunpowder Plot.* He died in 1623, at the age of 72, and was buried in Westminster Abbey. Before his death, he endowed a professorship of history at Oxford. The "Camden Society," for the publication of early historical and literary remains, is so named in his honor.

CAMEL, *Camelus*, a genus of quadrupeds of the order *ruminantia*, of which only two species exist, both of great use to mankind. This genus is the type of the family *camelidæ*, to which there belongs only one other genus, *auchenia* (q.v.), including the llama, alpaca, etc. The whole number of species of *camelidæ* is, therefore, very small, and they seem to belong originally to limited regions, both in the old world and in the new. To the peculiarities of these regions, they exhibit a wonderful completeness of adaptation. The family is regarded as forming a sort of link between the orders *ruminantia* and *pachydermata.* The dentition differs from that of all other ruminating animals, particularly in the presence of incisors or cutting teeth in the upper jaw; camels having also canine teeth in both jaws, and the llama and its congeners in the lower jaw of both sexes; and differences equally important appear in the feet, which have not the cloven hoof common to all the rest of the order—two short toes with separate hoofs adapted to one another—but two elongated toes, each tipped with a small nail-like hoof, the feet resting not upon the hoofs, but upon elastic pads or cushions under the toes.—In the camels, the toes are united by a common sole, thus resting upon one extended pad, instead of having each a separate one, as in the genus *auchenia;* the broader expanse of the foot enabling the animals of the one genus more easily to traverse the loose sand of the desert, whilst the separation of the toes in the other is suited to the uneven surface of rocky heights. The camels are also distinguished by the females having four teats, whilst those of the other genus have only two; and by a hump or humps upon the back, of which the llama and its congeners exhibit no trace. The long neck, small head,

prominent eyes, and tumid and cleft upper lip, with considerable prehensile power, are common to both genera; but with much similarity of form, as well as of particular characters, the *camelidæ* of the Andes exhibit a gracefulness of outline which strongly contrasts with the gaunt angularity of those of the eastern deserts. Camels are indeed animals of uncouth appearance. Of the two species, that known as the Arabian C. (*C. dromedarius*) has only one hump on the back, whilst the bactrian C. (*C. bactrianus*) has two. Some confusion has arisen from the occasional employment of the name dromedary as a designation of the former species, it being, however, more properly limited to a particular variety of that species, more slender and graceful than the ordinary variety, and of much greater fleetness. Buffon's notion, that the hump is a badge of servitude, and the consequence of harsh treatment throughout many generations, is singularly at variance with what we know of its uses. The hump on the C.'s back is a wonderful provision of nature, to adapt the animal to the endurance of long abstinence from food, or subsistence on very scanty supplies, to which it is often subjected in the desert, and without a capacity for which it would be comparatively of little value to man; and the wide deserts across which he journeys and transports his merchandise by its aid, would be altogether unpassable. The hump is, in fact, a store of fat, from which the animal draws as the wants of its system require; and the Arab is very careful to see that the hump is in good condition before the commencement of a journey. After it has been much exhausted, three or four months of repose and abundant food are necessary to restore it. The backbone of the C. is as straight as that of other quadrupeds.—Another very interesting adaptation to the desert is to be noticed in the thick sole which protects the feet of the C. from the burning sand, and in callosities of similar use on the chest and on the joints of the legs, upon which the C. rests when it lies down to repose, or kneels, as it does for various purposes, and is taught to do that it may be loaded, or that its rider may mount upon its back.—The wedge-shaped cutting-teeth of the lower jaw are also particularly fitted for browsing on shrubby plants, such as the desert produces —the camel's thorn, tamarisk, etc., which form a large part of the food of the C.; the eyes are furnished with long eyelashes, to protect them from the glare and from the drifting sand; whilst the exclusion of the sand from the nostrils is also provided for by a power of closing their oblique openings at will. But most interesting of all is the provision made for the C.'s endurance of long drought, by the lining of the inside of the second stomach, or honeycomb-bag, and of a portion of the first stomach or paunch, with great masses of cells, in which water is stored up and long retained. This store of water is well known to the Arabs, who, when sore pressed by thirst, sometimes avail themselves of it by killing some of the camels of the caravan.—The first stomach of the *camelidæ* is divided into two compartments by a muscular band—one of the points of difference between them and the other ruminants. Muscular bands, proceeding from this principal one, and intersected by other muscular bands, nearly at right angles, form the cells for containing water. It may be added here, that the senses both of sight and smell are extremely acute in the C., and that it is capable of discerning water at a great distance.

The Arabian C. carries twice the load of a mule. The Bactrian C. is sometimes loaded with 1000 or even 1500 lbs. weight, although not generally with so much. The East India company had at one time a corps of camels, each mounted by two men, armed with musketoons. The use of the C. for the conveyance both of travelers and merchandise has won it the name of the *ship of the desert.* A caravan sometimes contains 1000, sometimes even 4000 or 5000 camels. The supply of food carried with the caravan for the use of the camels is very scanty: a few beans, dates, carob-pods, or the like, are all that they receive after a long day's march, when there is no herbage on which they may browse. The pace of the loaded C. is steady and uniform, but slow; it proceeds, however, from day to day, accomplishing journeys of hundreds of miles at a rate of about 2½ m. per hour. Some of the slight dromedaries, however, can carry a rider more than 100 m. in a day. The motion of the C. is peculiar, jolting the rider in a manner extremely disagreeable to those who are unaccustomed to it; both the feet on the same side being successively raised, so that one side is thrown forward, and then the other.

The C. produces only one young one at a time, or rarely two. It lives 30 or 40 years.

The patience of the C. has been celebrated by some authors; and the cries by which it expresses its sense of injury when a heavy load is placed upon its back have been pathetically described. With all its general submissiveness, however, the C. is resentful of injury, and during the rutting season it becomes particurlaly vicious.

The flesh and the milk of the C. are much valued by the Arabs as articles of food. The dung is used for fuel, and it was from the soot of this dung that the sal-ammoniac, formerly imported from Egypt, was obtained by sublimation, whilst the sources from which that substance is now procured were unknown. The hair is used for the manufacture of cloth, some kinds of which are coarse, and others comparatively soft and fine. C.'s hair is also imported into Europe for the manufacture of the pencils or small brushes used by painters. The C. can now scarcely be said to exist anywhere in a wild state. It has lately been introduced into Australia.

A fossil species of C. (*C. Sivalensis*), larger than either of the existing species, has been discovered in the tertiary deposits of the Sewalik hills, in Hindustan.

CAMEL, a machine for floating ships over shoals and bars. A long water-tight box, or caisson, nearly filled with water, is sunk on either side and attached to the ship, and then the water in the caissons is pumped out, adding additional buoyancy as they become empty. The C. is sometimes employed in raising sunken ships, and the principle is applied to dry-docks in some instances.

CAMELFORD, a t. in the n.w. of Cornwall, near the source of the Camel (crooked brook), 14 m. w. of Launceston. It lies in a high and hilly tract near the moors. Pop. about 1600. C. is said to have been the scene of a battle, in 542, between king Arthur and Mordred, his nephew, when both were slain. The West Saxons, under Egbert, had a battle with the Britons here in 823. The ruins of king Arthur's castle, Tintagel, stands on the high rocky coast, 4 m. n.w. of Camelford. Two m. n. of C. are the celebrated slate-quarries of Delabole, employing a large number of men. Macpherson, the author or translator of Ossian, was member of parliament for C. in 1791, but the reform act of 1832 disfranchised the borough.

CAMELLIA, a genus of plants of the natural order *ternstræmiaceæ* (q.v.), natives of China, Japan, and the n. of India—some of which are now among the most common and admired green-house shrubs in Britain and other countries too cold for their cultivation in the open air, receiving the same sort of attention which is bestowed on other florists' flowers, and with the same result, of an endless multiplication of beautiful hybrids and varieties. The best known and most esteemed is *C. Japonica.* Its leaves are ovate-elliptical, almost acuminate and serrate, shining; the flowers without stalks, mostly solitary, large, and rose-like. It is a native of Japan; and there and in China it has been carefully cultivated from time immemorial. In its wild state, it has red flowers; and the red single C. is much used by gardeners as a stock on which to graft the fine varieties, the flowers of which are generally double, and in many cases most completely so. Many of them are of Chinese or Japanese origin; many have been raised by cultivators in Britain, continental Europe, and America. Their colors are very various; and the varieties also differ much in the form and position of the petals. It adds to the value of the C. that its flowering time is in autumn, winter, and spring. By those who can afford the expense, entire houses are often devoted to the culture of camellias. Some cultivators are careful to protect them from direct sunshine, others recommend an opposite treatment in this particular; it is agreed by all that free access of air is of great importance, and that water must be given very liberally, yet with such caution that the soil may never remain soaked after the immediate wants of the plant are supplied. The cultivation of camellias in the windows of houses is often attended with disappointment, from the buds dropping off when almost ready to expand, which is generally owing either to a neglect or an excess of watering; an apparently slight mistake, either of the one kind or of the other, being very speedily productive of this evil. Too much heat at this time is also apt to cause the flower-buds to fall off. The C. flowers well, when the temperature is kept not very much above the freezing-point, but frost it cannot bear. In the s. of England, some of the varieties are occasionally trained to walls in the open air, receiving a little protection in winter. The proper soil for camellias is a loose black mold; a little sand and a little peat are often advantageously mixed with loam to form it. Camellias are often propagated by cuttings, often by layers; but the finest varieties very generally by grafting or by inarching. The single C. is also propagated by seed, and in this way the best stocks for grafting are procured.—Of the other species of C., the most hardy, and one of the most beautiful, is *C. reticulata,* from which not a few of the varieties now in cultivation are partly derived.—*C. oleifera* is extensively cultivated in China—not, however, in the more northerly parts—for its seeds, from which an oil is expressed after boiling, very similar to olive oil, and much in use as an article of food and otherwise in the domestic economy of the Chinese. The seeds of almost all the species, however, yield this oil.—*C. Sasanqua* bears the name of Sasanqua Tea. It is cultivated in China for the sake of its flowers, which are said to be used for flavoring certain kinds of tea.

CAMELLIA'CEÆ, an order of exogenous trees and shrubs in s. and e. Asia and South America; North America has four species. The tea plant and the camellia are specimens.

CAMELOPARDA'LIS. See Giraffe.

CAMELOPARDA'LIS, a constellation defined by Hevelius, between the pole-star, Auriga, Cassiopeia, and the head of Ursa Major, consisted of stars of the 4th and lower magnitudes, forming, in imagination, the shape of a giraffe.

CAMEL'S HAIR is woven by Persians and Arabs into material for tents and clothing. In early ages rough garments of this stuff were worn by monks and priests by way of penance. A fine article of camel's hair is used for pencils by artists.

CAMELS HUMP, or Camel's Back Mountain, one of the peaks of the Green mountains, 4188 ft. high; 17 m. w. of Montpelier, Vt.

CAMEL'S THORN, *Alhági,* a genus of plants of the natural order *leguminosæ* (q.v.), sub-order *papilionaceæ,* containing a number of herbaceous or half-shrubby species, natives chiefly of the deserts of the east, having simple leaves, minute stipules, racemes of red flowers, and jointed pods with one seed in each joint. These plants are of great

importance on account of the food which they afford for camels, where other vegetation is far from being abundant; and camels are particularly fond of them. *A. camelorum*, a herbaceous species, yields a kind of manna (q.v.), which appears in the form of drops, as of honey, on the leaves, and gradually hardens. A similar exudation is yielded by *A. nipalensis*, another herbaceous species; but it is not certain that the manna of Persia and Bokhara is produced, as has been alleged, by *A. maurorum*, a shrubby species 2 or 3 ft. in height, which certainly does not yield it in India or Egypt; the supposition that this exudation results from some peculiarity in the climate of Persia and Bokhara, being perhaps less probable than that of a mistake concerning species not very dissimilar.

CAME'NÆ, nymphs with prophetic powers in Roman mythology, named Egeria, Carmenta, Antevorta, and Postvorta. The poets sometimes give the name to the nine muses.

CA'MENZ, or KAMENZ, a t. in Saxony, 22 m. n.e. of Dresden; pop. '71, 6406. In 1742, the town was nearly destroyed by fire. Lessing was born here, and in 1826 a public hospital was dedicated to his memory.

CAMEO (Ital. *camei*). Gems cut in relief are called cameos, in opposition to those that are hollowed out so as to yield a raised impression, which are called *intaglios*. The term C., however, is applied more especially to those diminutive pieces of sculpture which are prepared from precious stones having two strata or layers of different colors, the undermost of which is left to form the background, the object to be represented being cut in the upper one. The stone generally used for this purpose by the ancients was the variegated onyx.

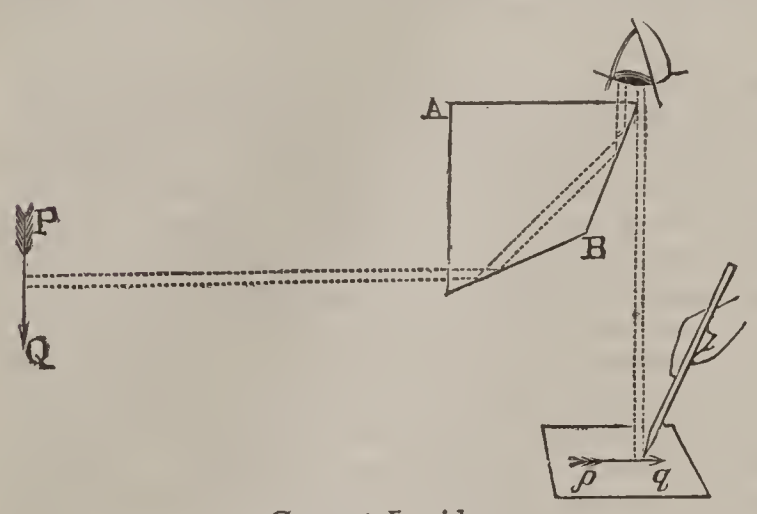
The art of cameo-cutting is of great antiquity. It is believed to have been of Asiatic origin, and to have been practiced by the Babylonians, from whom the Phenicians carried it into Egypt. From the Egyptians, it was transmitted to the Greeks, who brought it to great perfection; and latterly it was practiced very extensively, and more successfully than perhaps any other art, in Rome. To what extent the gems, commonly called Etruscan, are in reality early Greek, is a subject of dispute amongst the learned. It was not till a comparatively late period—the age following Praxiteles—that cameo-cutting became popular in Greece; and it was in the courts of the successors of Alexander that it was chiefly patronized. At this period, cameos were very extensively used, not only as personal ornaments, but in cups, vases, candelabra, and other objects of domestic luxury. Pateræ and other vessels were frequently worked out of a single stone, upon which were exhibited a whole series of figures of the most exquisite workmanship. Many of the antique cameos which have been preserved are wonderfully beautiful both in design and execution. The finest specimen in existence is said to be the Gonzaga C., formerly at Malmaison, now at St. Petersburg. It represents the head of a prince and his wife, probably Ptolemy I. and Eurydice. Winckelmann mentions a C. representing Perseus and Andromeda, in such high relief, that almost the whole contour of the figures, which are of the most delicate white, is detached from the ground. It belonged to the painter Mengs, and at his death was purchased by the empress Catharine of Russia. The only other gem which Winckelmann is disposed to rank with that just mentioned, is "the Judgment of Paris" in the cabinet of the prince Piombino at Rome. Of cameos of the Roman time, many fine specimens are to be found in the continental museums. The most celebrated C. in England is the "Cupid and Psyche," in the Marlborough collection, by Tryphon, who is supposed to have lived in Macedon under the immediate successors of Alexander. The stones on which many of these cameos are cut are of surprising, and, in modern times, unequaled size and perfection. They are supposed to have been procured by the ancients through their oriental and African commerce. Cameos do not seem to have been made in mediæval times; but the art revived in Italy, under the auspices of of the Medici; and the production of cameos, both in *pietra dura* and in shell, has there become a branch of art-manufacture of considerable importance. Impressions from antique cameos in glass, sulphur, porcelain, and other materials, are produced in many places; and for artistic purposes, possess all the value of the originals.

Glass Cameos.—The manufacture of cameos from artificial substances was not unknown to the ancients. One of the most beautiful specimens of an imitation of C. in glass is the famous Barberini or Portland vase, now in the British museum. The ground is blue, the figures, which are in low relief, being of a delicate, half-transparent white. See PORTLAND VASE. Many fragments of the same kind of manufacture exist in other cabinets, but that which we are fortunate enough to possess is believed to be the only perfect example.

Shell Cameos.—The art of imitating cameos in shell, which has now attained to such perfection as to rival the delicacy and finish even of antique workmanship, and which is a process quite as artistical as their production from gems, is of modern invention. The shells, like the stones, chosen for this purpose, are such as possess layers of different colors. The most useful are the *bull's mouth*, the under layer of which is red, resembling the sardonyx; the *black helmet*, which has a dark onyx ground; and the *queen's conch*, of which the ground is of a pinkish hue. These shells have three strata, the undermost of which forms the ground, the figure being sculptured in the second, and the third serving to mark the hair, wreaths, armor, and other more prominent objects. The portion of shell having been prepared of the requisite size, form, and thickness by various

mechanical means, it is fixed by some adhesive substance—usually rosin—to a small block of wood, of such form and thickness as to be conveniently grasped by the artist in his left hand. The outline of the object or objects to be represented is then sketched with a pencil, and, in the case of portraits, is usually copied from a previous pencil-sketch on paper. The pencil-marking on the shell is then followed with a scratch-point, and the surrounding white substance is removed by means of files and gravers. This latter process, which is more mechanical than the rest, is usually performed by an assistant. The artist then proceeds slowly and carefully to work out his subject by the use of smaller tools; those used at last for deepening the finer lines being scarcely larger than ordinary darning-needless. The manufacture of shell-cameos in Rome commenced about 1805, and is said to have been of Sicilian origin. The art was at first confined to Italy; but during the last 35 years, it has been carried on in Paris to a greater extent than even in Rome, though not with equal success. A large proportion of the whole cameos manufactured in France are imported into England, and many of them are mounted as brooches, and exported to the United States and the British colonies. Saolini and Giovanni Dies have long been celebrated as artists in shell-cameo in Rome, whilst Girometti has enjoyed a similar reputation for his works in *pietra dura*.

CAMERA LUCIDA, an optical instrument constructed of various forms, and for various purposes. Dr. Wollaston's C. L., intended to facilitate the perspective delineation of objects, consists of a small quadrilateral prism of glass, of which AB in the annexed figure is the perpendicular section, held in a brass frame, which is attached to an upright rod, having at its lower end a screw-clamp, to fix it to the edge of a table. The prism being at the height of about a foot from the table, has its upper face horizontal. Two of its faces, as in the figure, are at a right angle at A; the contiguous faces make respectively with them angles of 67½°; so that the remaining obtuse angle at B contains 135°. Rays coming from an object PQ, and falling nearly perpendicularly on the first surface, enter the prism, and undergo total reflection at the contiguous surface (see Dioptrics); they then fall at the same angle on the next surface, and are totally reflected again; finally, they emerge nearly perpendicularly to the remaining surface. An eye, as in the figure, then receives the emergent pencil through one part of the pupil, so that an image, *pq*, of the object is seen projected upon a sheet of paper upon the table. The rays from the drawing-pencil passing the edge of the prism, enter the other part of the pupil; and the pencil and image being seen together upon the paper, a sketch of the latter can be taken. There is, however, a practical difficulty—the image and the drawing-pencil are at distances sensibly different from the eye, and so cannot be seen together distinctly at the same time. To obviate this, a plate of metal, with a small aperture as an eye-hole, is placed at the edge under the eye, so that the rays through the prism, and those from the drawing-pencil, which both pass through the eye-hole, form only very small pencils. By this, the difficulty is greatly diminished. It is still, however, difficult to use the instrument satisfactorily; and though many acquire great readiness in its use, others have never been able to attain the same facility. The instrument is remarkable for its small bulk and portability. A good one will pack in a box 8 in. by 2, and ½ in. deep. Besides this form of the C. L., which is the most common, there are others. Its simplest form is merely a piece of smooth glass fixed at an angle of 45° to the horizon. An image from a horizontal object falling on this glass will be perfectly reflected, and that in the vertical, so that the eye looking vertically down will see the image, and, owing to the transparency of the glass, the artist will be able to trace it out upon paper below. In this case, however (see Catoptrics), the image will be inverted.



Camera Lucida.

CAMERA OBSCURA (literally, a dark chamber), an instrument invented by Baptista Porta in the 16th century. It is known in its simplest form as a familiar toy, consisting of a rectangular box, furnished at one end with a lens whose focal length is equal to the length and depth of the box; at the opposite end of which a plane reflector is placed at an angle of 45°, which throws the image of any objects to which the lens may be directed on a piece of ground-glass on the top of the box in a non-inverted position, so that they may be viewed or sketched from as in nature.

The C. O. being now an indispensable article in the practice of photography, has received a number of recent improvements, which make it rank as a scientific instrument. The principle, however, involved in the simplest and most refined forms is the same, and may be illustrated and made intelligible by the following experiment: Let a small hole be bored in a window-shutter, and the room be darkened. If, now, the beam of light entering the room by this hole be intercepted by a sheet of white paper,

held at a small distance from the hole, an inverted image of objects without will be seen upon the paper. By placing a small convex lens over the hole, this image is rendered much more distinct, or *sharp*, in photographic language. Moreover, it will be found that, at a certain distance from the hole, the image attains a maximum degree of sharpness; and that if the paper be removed from this point to any position either nearer to the hole or further from it, the image becomes indistinct and confused. At the point of greatest distinctness, the image is said to be *focused*. Such being the principle of the camera, it is evident that in practice the instrument may assume many forms, provided always that it consists of a darkened box or chamber having a hole at one end for the insertion of a lens, or combination of lenses, and at the other a screen, generally made of ground-glass, on which to receive the image.

The body of the instrument may be made of any opaque substance; the tube or tubes are generally formed of brass, and contain one or more lenses; there is the obscured or ground-glass, upon which the image is thrown for the purpose of adjusting the focus; and the rack behind, by means of which, and the double sides of the camera, the body of the instrument may be lengthened or shortened till the image on the ground-screen is accurately focused. This rack is most frequently placed upon the tubes carrying the lenses. The interior of the whole apparatus is blackened, to prevent reflection of the rays falling on their sides, and to impart greater distinctness to the picture.

The *camera-slide* is a thin, dark box, and is used for conveying a sensitive plate from the operating-room to the camera, and back again after exposure. It consists of a rectangular frame, made to fit exactly into the back of the camera when the focusing-screen is removed. At the back is a hinged door, by means of which the plate is introduced into the slide; and in front is a shutter, which is pulled up when the plate is to be exposed, and shut down after the time requisite for the action of the light upon the plate has expired. It must be constructed so that, when substituted for the focusing-screen, the surface of the prepared plate, which is intended to receive the image, shall correspond exactly in distance from the lens with the ground-surface of the focusing-screen. The plate rests upon projections of silver wire in the corners of the slide; and the same slide may be used for plates of different sizes, by introducing into it thin frames of suitable dimensions also furnished with silver-wire corners.

Photographic cameras are generally required for one of three purposes—viz., portraits, landscapes, or copying; and for each of these it is necessary to make suitable modifications in the construction of the instrument. A camera has, however, been recently contrived which combines within itself the conditions necessary for all contingencies. It is called Martin's universal portrait, landscape, and copying camera, and consists, primarily, of a base-board, 30 in. long and 11 in. wide, divided into three pieces, and hinged together by means of broad brass hinges, so as to diffuse the bearing as much as possible, and bolted together when in use by sliding panels of mahogany, extending across the entire width of the base-board. This base-board being grooved on its outer edges, allows the sliding portions of the camera to be moved from one end to the other, so as to alter the relation between object, lens, and image *ad infinitum*.

What may be regarded as the body of the camera, is of the same construction as an ordinary expanding camera, except that it is furnished with additional apertures for camera slides, and the front and the back are united by means of an accordion or bellows body of suitable length to extend from one end of the base-board to the other.

CAMERA'RIUS, Joachim—originally, *Liebhard*, which name he changed into C., because his forefathers had been *Kämmerer* (chamberlains) at the court of the bishop of Bamberg—was born at Bamberg, April 12, 1500, and died at Leipsic, after a life devoted to literature, April 17, 1574. He was by nature earnest and taciturn; but the extent of his knowledge, his sobriety of opinion, strength of character, and, when he pleased, overpowering eloquence, won for him the esteem of all his contemporaries. His works, of which several still remain valuable, include an excellent biography of Melanchthon, and a collection of letters by this reformer; also annotations on Cicero's *Quæstiones Tusculanæ* (1525); *Elements of Rhetoric; Commentarii Linguæ Græcæ et Latinæ* (1551); and *Epistolæ Familiares* (1583–95), giving interesting notices of his times.—His son, Joachim C. (b. 1534, d. 1598), was one of the most learned physicians and botanists of his age.

CAMERA'RIUS, Rudolph Jakob, 1665–1721; a German botanist and physician, professor of medicine and director of the botanic garden at Tübingen. He was the first to observe and establish the sexual theory of plants.

CAMER'INO (ancient *Camerinum*), a t. of central Italy, in the province of Macerata, situated on a hill at the foot of the Apennines, 41 m. s.w. of Ancona. It has a cathedral, occupying the site of a temple to Jupiter, a university, and some manufactures of silk. Its bishopric dates from the 3d c.; and it was made an archiepiscopal see in 1787. Pop. 5,500.

CAMERON, a parish in s.w. Louisiana, on the gulf of Mexico; surface low, with many swamps; productions, agricultural; pop. '80, 2415—328 colored. Chief town, Grand Chenière.

CAMERON, a co. in n.w. Pennsylvania, traversed by the Philadelphia and Erie railroad; 400 sq.m.; pop. '80, 5159. Productions, agricultural. Co. seat, Emporium.

CAMERON, a co. in Texas, on the gulf of Mexico and the Rio Grande; 3,000 sq.m.; pop. '80, 14,959—124 colored. The portion along the Rio Grande is very fertile; the remainder is grazing land. Co. seat, the city of Brownsville, opposite Matamoras.

CAMERON, Angus. See page 887.

CAMERON, Donald, a Scottish highland chief who fought for the pretender and was wounded at Culloden, but escaped to France. He was the "Lochiel" of Campbell's poem.

CAMERON, James Donald (usually called "Don" Cameron), b. Harrisburg, Penn., 1833; eldest son of Simon; graduated at Princeton college in 1852, and since largely engaged in iron, coal, and manufacturing industries of his state. As president of the Northern Central railroad, he did great service to the union cause during the war. In 1876, he was appointed secretary of war, and in Mar., 1877, succeeded his father as U. S. senator. In 1879, he was chosen chairman of the republican national committee in place of Zachariah Chandler, deceased. This position he resigned in 1880.

CAMERON, John, a famous scholar and divine, was b. at Glasgow about the year 1580, and educated at the university of that city, where, in his 20th year, he held an appointment as reader in Greek. In 1600, he set out to travel in France, where his ability and erudition secured for him a philosophical professorship in the university of Sedan. He afterwards acted as a Protestant clergyman at Bordeaux, and on the death of Gomarus, was appointed to the divinity chair in the university of Saumur, an appointment he held until 1620. Returning to Britain, he was appointed professor of divinity at Glasgow; but in less than a year he returned to Saumur; thence to Montauban, where he received a divinity professorship. Here his opposition to the party who advocated a civil war made him many enemies, by one of whom he was stabbed in the street; and he died from the effects of the wound in 1625. He was considered one of the best scholars of his time; in Biblical criticism, he was inclined to be perverse; where there was a difficulty, he usually chose the opposite view to that held by other divines, especially Beza. His theological opinions were of a somewhat lax character, his works being said to be the foundation of Amyraut's doctrine of universal grace.

CAMERON, Richard, a Scottish Presbyterian preacher in the 17th c., who suffered death for the cause he espoused, and from whom the religious sect ordinarily called Cameronians (q.v.) has been named. C. belonged to the extreme party, who held by the perpetually binding obligations of the solemn league and covenant (see Covenants), which were set aside at the restoration of Charles II. Along with some others, he strenuously resisted those measures that reinstated the Episcopal church in Scotland, and that proscribed the meetings for public worship of unauthorized religious bodies. Contrary to law, he persisted in preaching in the fields, and became obnoxious to government, to which, indeed, he finally assumed an attitude of defiance. In June, 1680, he, in company with about twenty persons of equal zeal, well armed, entered the town of Sanquhar; and in the market-place they formally renounced their allegiance to Charles II., who had so grossly abused his power, and declared war against him and all his adherents. After this act they retired to the hills between Nithsdale and Ayrshire, where they succeeded in evading capture for a month, though a price of 5,000 merks had been set upon C.'s head by government, and 3,000 upon the heads of the others. On the 20th July, 1680, however, they were surprised by a vastly superior force in Aird's Moss, and after a brave fight, C. was killed. His hands and head were cut off, and fixed upon the Netherbow Port, Edinburgh. C. ranks as a martyr, and has an honorable place in the history of *Scots Worthies*.

CAMERON, Simon, b. in Lancaster co., Penn., 1799. In 1845, he was elected by the democrats to the U. S. senate, but joined the republicans on the organization of that party, and was by them re-elected to the senate in 1856. In 1861, he was secretary of war, and in 1862 minister to Russia. Twice again he was chosen senator, in 1866 and in 1872, and was succeeded in that office in 1877 by his son, James Donald. He is one of the leading financiers and business men of the state.

CAMERON, Verney Lovett, the African traveler, son of the Rev. J. H. L. Cameron, vicar of Shoreham, Kent, was b. in 1844. He entered the navy in 1857, and served some time on the e. coast of Africa. In 1873, he took charge of an expedition to relieve Livingstone, his orders being to join him by the nearest route. He started from Bagamoyo in Mar., and in Aug., at Unyanyembe, met Livingstone's followers bearing his remains to the coast. After making arrangements for their safe arrival, he proceeded to Ujiji, where he found some of Livingstone's papers and a map, which he forwarded to Zanzibar. He then made a survey of lake Tanganyika, which he found to be disconnected with the Nile system. In the belief that the Lualaba was the upper waters of the Congo, he resolved to follow its course to the w. coast; but owing to the hostile interposition of the native chiefs, was prevented from verifying a conviction, the correctness of which was soon afterwards demonstrated by Stanley. Taking a more southerly route, he reached the Portuguese settlement of Benguela, on the w. coast, in Oct., 1875, whence he returned to England. An account of his travels, which contains a vast number of valuable scientific observations, was published in 1877 in 2

vols., under the title of *Across Africa*. C. was made a companion of the bath, and raised to the naval rank of commander. C. made, '82, explorations in S. Africa.

CAMERON, WILLIAM E. See page 887.

CAMERON HIGHLANDERS (the Queen's Own Cameron Highlanders), the designation given to the 79th regiment of infantry in the British service, in consequence of the corps having been raised by Allan Cameron of Erroch in 1793. Originally, it consisted of 1000 men, but a second battalion was added in 1804. This gallant regiment, which wears the Highland garb, performed distinguished services in the Peninsula and at Waterloo, and in the chief warlike struggles of more recent times.

CAMERO'NIAN REGIMENT, the 26th regiment of infantry in the British service, so called from having had its origin in a body of Cameronians (q.v.) during the revolution of 1688. Taking advantage of their zeal and courage, the convention which sat at Edinburgh induced a number of them to assist in the revolution, which it was imagined by some was to re-establish the reign of the covenants. They were induced to enlist on the understanding that the special object of the corps was "to recover and establish the work of reformation in Scotland, in opposition to popery, prelacy, and arbitrary power, in all the branches and steps thereof, till the government in church and state be brought to that luster and integrity which it had in the best of times." (See Burton's *History of Scotland*, vol. i. p. 49.) Thus was formed the celebrated C. R., with the youthful lord Angus as col., and William Cleland as lieut.col. and actual commander. Under Cleland, not yet in his 30th year, the regiment was sent northwards to quell the insurrection, after the fall of viscount Dundee. Surrounded by from 4000 to 5000 Highlanders, the Cameronians, only 800 strong, gallantly defended themselves during a whole day in Dunkeld, Aug. 21, 1689. In this terrific struggle, the brave Cleland was killed. Considering the issue of the revolution, they had been entrapped into military service, and their employment on foreign service afterwards greatly scandalized the Cameronian sect. The regiment has ever done credit to its origin; being distinguished alike for gallantry and for good conduct.

CAMERO'NIANS, the religious sect in Scotland popularly named after Richard Cameron (q.v.). Its official designation, however, is that of Reformed Presbyterians. No doubt, the principles of the body are those for which Cameron contended and died; but not till after 1688 did the small body of Presbyterians, who insisted upon the restoration of the civil and ecclesiastical polity of 1638 to 1649 in opposition to the revolution settlement, assume a distinct form. According to the solemn league and covenant, ratified by the parliaments of England and Scotland, and also by the assembly of divines at Westminster in 1643, presbyterianism was to be maintained in the kingdoms of England, Scotland, and Ireland, and popery, prelacy, superstition, heresy, schism, etc., were to be extirpated. As a measure of pacification, presbyterianism was established in Scotland by act of parliament, 1690; but it was of a modified kind, rendering the church a creature of the state, more particularly as regards the calling of general assemblies. Equally to the disgust of the extreme party referred to, prelacy was confirmed in England and Ireland, and there was a general toleration of heresy—i.e., dissent. In sentiment, if not in form, therefore, this party repudiated the government of William III. and his successors, and maintained the perpetually binding obligations of the covenants. Unquestionably, these C. acted under strong convictions, and only desired to carry out to a legitimate issue theoretical principles of the church of Scotland which, for prudential considerations, have been practically in abeyance; and it is in the standards of this sect that we find a true embodiment of the tenets held by the great body of English and Scotch Presbyterians of 1643. Although thus an elder sister of the existing church of Scotland and all its secessions, it was with some difficulty that, after the revolution, it organized a communion with ordained ministers. The steadfastness of members was put to a severe trial by the defection of their ministers; but in 1706, after their faith and patience had been tried for 16 years, they were joined by the Rev. John M'Millan, from the Established church; and shortly afterwards, by the Rev. John M'Neil, a licentiate of the same church. To confirm the faith of members, and give a public testimony of their principles, the covenants were solemnly renewed on Auchensauch hill, near Douglas, in Lanarkshire, in 1712. The subsequent accession of the Rev. Mr. Nairne enabled the C. to constitute a presbytery at Braehead, in the parish of Carnwath, on the 1st of Aug., 1743, under the appellation of the Reformed presbytery. Other preachers afterwards attached themselves to the sect, which continued to flourish obscurely in the w. of Scotland and n. of Ireland. For their history and tenets, we refer to the *Testimony of the Reformed Presbyterian Church* (Glasgow, John Keith, 1842). Holding strictly to the covenants, and in theory rejecting the revolution settlement, the political position of the C. is very peculiar, as they refuse to recognize any laws or institutions which they conceive to be inimical to those of the kingdom of Christ; from which cause many of them formerly isolated themselves from general society, and refused several of the responsibilities and privileges of citizens. In 1860, there was an attempt on the part of some of the kirk-sessions to prevent the members becoming volunteers, on account of the oath of allegiance which required to be taken. On the question coming before the synod, it was decided (1863) that excommunication for taking the oath should cease. In consequence of this decision, 10 or 12 congregations seceded. In 1876, the larger body of the Reformed Presbyterians, consisting of about 45 congre-

gations, was formally united to the Free church of Scotland, so that the distinctive features of the Cameronians are now represented by the few congregations which seceded in 1863.

CAM'ERONITES, a sect in France, followers of John Cameron of Scotland. They are moderate Calvinists, and assert that the will of man is determined only by the practical judgment of the mind; that the cause of men's doing good or evil proceeds from the knowledge that God infuses into them; and that God does not move the will physically, but only morally, by virtue of its dependence on the mind. This peculiar doctrine of grace and free-will was adopted by many eminent teachers who thought Calvin's doctrine too harsh.

CAMEROONS', a river of upper Guinea, Africa, which enters the bight of Biafra from a n.e. direction, in about lat. 4° n., long. 9° 40′ e., by an estuary some 20 m. in breadth. Its length is not certainly known, but for 40 m. upwards its breadth averages nearly a quarter of a mile, its depth varying in the dry season from 2 to 20 feet. The left bank of the river is steep and high, the right for many miles low and swampy. and covered with mangroves, There are several populous and thriving villages on its banks, whose inhabitants carry on an extensive trade in palm-oil, and ivory, obtained in great quantity from dead elephants, which have perished in search of water in a great morass inland.—C. is also the name of a cape on one of the islands of the estuary.—C. Peak is the name of the culminating point in the C. mountains, which in lat. 4° 13′ n., and long. 9° 10′ e., has an elevation estimated at 13,000 feet.

CAMEROONS' (*ante*), mountains on the w. coast of Africa between 3° 57′ and 4° 25′ n., and 9° and 9° 30′ e.; a volcanic mass covering 700 sq.m., the highest about 13,000 feet. They touch the gulf of Guinea on the w. and south. Capt. Burton ascended these mountains in 1861, finding the sides for about 4000 ft. covered with a dense growth of palms, acacias, figs, cardamoms, cabbage-trees, oaks, ferns, and bamboos. Higher up were smaller trees, and at 4580 ft. there began a labyrinth of lava streams and fields of slag. At about 8000 ft., craters appeared, of which there are nearly 30. The natives tell of an eruption in 1838.

CAME'TA, a t. of Brazil, on the Tocantins, which joins the estuary of the Amazon from the south. It has a fertile district attached to it, which is estimated to contain 20,000 inhabitants.

CAMILLA, in Roman fable, a virgin wonderfully swift of foot who aided Turnus against Æneas. She was said to be a daughter of king Metalus.

CAMILLUS, Marcus Furius, a celebrated Roman patrician who first makes his appearance as consular tribune, 403 B.C. His military career was a series of unbroken successes, according to the accounts which have come down to us; but these accounts have been shown by Niebuhr to possess a considerable admixture of mythological or poetic fiction. In 396, C. was made dictator, during the Veientine war, in which he mined and captured the city of Veii; but the proud splendor of his subsequent triumph offended the Roman populace, who were still further displeased when C. demanded a tithe of the spoils of Veii, in order to fulfill a vow made to Apollo, on condition of victory. In 394, C. was again elected consular tribune, and besieged the Falerii, who after bravely defending themselves, were led by a magnanimous act of C. to yield unconditionally. Afterwards, C., being accused of peculation, and foreseeing certain condemnation, banished himself from Rome, 391, and lived in retirement at Ardea, until Brennus, at the head of his wild Gauls, had swept through Etruria, and captured and destroyed the whole of Rome except the capitol. C. was now recalled, and appointed dictator a second time. He achieved a decisive victory over the invaders, rebuilt Rome, and obtained new victories over the Volsci, and others. In 386 B.C., he was elected dictator for the third time, but refused the office. In 381 B.C., C. was victorious in the war of Rome against Præneste and other Latin towns; and in 368 B.C., he was elected to his fourth dictatorship, but abdicated during the same year. In 367 B.C., when war broke out with the Gauls, C., though 80 years old, accepted the dictatorship for the fifth time, defeated the barbarians near Alba, and made peace between patricians and plebeians. After this, he erected near the capitol a temple to Concord, and, having retired from public life, died 365 B.C., of the plague, lamented by the whole Roman people.

CAMILLUS and CAMILLA, applied in ancient Rome to the boys and girls who shared in sacrificial ceremonies. If they were designed for the priesthood, it was necessary that their parents should be still living and free-born.

CAMINATZIN', or Cacumazin, d. 1521; king of Mexico; nephew of Montezuma. He was one of the victims of the treachery of Cortes, against whom he had declared war. At the instigation of Cortes, Montezuma invited his nephew to the city of Mexico to make a reconciliation with the invaders. He replied that he would enter that city only to destroy the enemies of the country. Still influenced by Cortes, Montezuma had the young prince seized, but his captors permitted Cortes to get possession of him, and he was kept a prisoner until the expulsion of the Spaniards. He probably died soon after the siege of Mexico.

CAMISARDS, the name given to the peasantry of the Cevennes, a mountainous region in s. France, who for several years from 1702 kept up an organized military resistance to the *dragonnades*, or conversion by torture, death, and confiscation of property, by which, after the revocation of the edict of Nantes, the Roman Catholic leaders endeavored to enforce their authority in all the Huguenot districts. The name is of doubtful origin; some say it was from *camise*, a white shirt or frock, outwardly worn by the peasants; others that it was from *camisade*, a night attack; and still others, from *camis*, a road runner. The C. were also called barbets (or water dogs, a term also applied to the Vaudois), vagabonds, assemblers (a name given to a meeting or convention of Huguenots), fanatics, and children of God. They belonged to the romance-speaking people of Gothic descent, who took part in the earliest movements towards religious reform. It was in Languedoc that the peace of God and the mercy of God were formed in the 11th c. against the miseries of private war. (See GOD'S TRUCE, *ante*.) There were preserved the forms of municipal freedom, which nearly all Europe had lost; and there commerce flourished without spoiling the thrift, the patience, or the simplicity of the national character. Calvin was warmly welcomed when he preached at Nîmes, and Montpellier became the chief center for the instruction of Huguenot youth; but it was in the triangular mountainous plateau called Cevennes (see CEVENNES, *ante*), among the small farmers, the cloth and silk weavers, and the vine-dressers, that Protestantism was most universal and intense. The people were, and still are, very poor; but they are intelligent and pious, and add to the deep fervor of the Provençal character a gravity that is probably the result of the trials and sufferings of their ancestors.

To understand the position of the C. in the war which began at the commencement of the 18th c. it is necessary to glance at the preceding history of France. The system of toleration which was established by the edict of Nantes (see *ante*), April 13, 1598, and the edict of Grace, July, 1629, was essentially a political compromise, and not a recognition of religious equality. The right of having a private chapel was given to certain seignieurs. New public churches were to be authorized at a certain rate in certain places. On the other hand, Calvinists were admitted to all public posts and to all professions; and they could publish books in towns where they had churches. The chamber of edict was formed in the parliament of Paris for the impartial judgment of cases brought by Huguenots; and the half-Catholic, half-Protestant constitution was adopted in the town consulates and the local parliaments of the south. After the short struggle between Louis XIII. and the duc de Rohan, the Huguenots settled down into contented industry; the army and navy of France were led by two Huguenots—Turenne and Duquesne—and Cardinal Bentivoglio wrote to the pope that he no longer found in France the insane fervor for right of conscience so radical among the Huguenots. But the court in which Mme. de Maintenon had succeeded to Mme. de Montespan, where Louvois, and the Jesuit, père la Chaise, were as supreme as Bossuet and Flechier in the church, could not long be satisfied with tolerated heresy, which they chose to consider as vailed rebellion. On the death of Mazarin a commissioner had gone over the kingdom to inquire into the titles, or rather to suppress as many as possible, of the Huguenot churches, schools, and cemeteries. The extirpation of heresy had indeed been provided for by a clause in the marriage contract between Louis and Maria Theresa as long before as 1660, and in spite of the protection of Colbert, a policy was begun of gradually destroying the privileges of dissenters. They were shut out from public offices and trade corporations; they were forbidden to marry with Roman Catholics, and the conversion of their children seven years old and upward was encouraged and almost enforced. The famous edict came in Oct., 1685. It directed all dissenting churches to be destroyed, forbade their religious meetings under pain of imprisonment and confiscation of property, ordered all pastors who would not change their faith to be banished within fifteen days and to stop preaching at once, promised exemption from taxes and increased salaries to converted ministers, suppressed Huguenot schools and directed all children to be baptized and brought up in the Roman Catholic faith, prohibited all Huguenots except ministers from going abroad, and declared the property of those who had already gone to be forfeited unless they returned within four months. These were the main points of the edict revoking the liberal edict of Nantes. In carrying it out Huguenot Bibles and books of instruction were burned, and Huguenots were forbidden to hire themselves as artisans or as domestic servants. Torture, hangings, insults worse than death to women, the galleys, and imprisonment for life were the ordinary occurrences of the next sixty years. In the twenty years preceding the revocation, it is believed that 400,000 Protestants fled from France, and that 600,000 escaped in the twenty years that followed. But in the Cevennes the people were too poor to escape, and all over Languedoc began the secret meetings of the church of the desert. At last Louvois, the sanguinary war minister of Louis XIV., proposed that this district should be made an actual desert. An army of 40,000 was raised, and forts were erected at Nîmes, St. Hippolyte, Alais, and Anduze. The abbe du Chaila, a Roman Catholic missionary from Siam, had been appointed inspector of missions in the Cevennes. He introduced the "squeezers" (an instrument of torture which resembled the Scotch "boot"), and his cruelty at last broke the patience of the victims. His assassination, July 23, 1702, was the first blow in the war. There was to have been a general massacre of

Roman Catholic priests, but the plan failed, and the originator, Esprit Seguier, soon fell. He was succeeded by La Porte, an old soldier, who, as his forces increased, assumed the title of "colonel of the children of God," and named his country the "camp of the eternal." His captains were selected from those on whom the prophetic influence had fallen, such as the forest-ranger, Castanet; the wool-carders, Conderc and Mazel; and the soldiers, Catinat, Joany, and Ravenel; but the most famous were Roland and Jean Cavalier, the baker's boy (see CAVALIER, JEAN). For three years the C. held out. Then there was sent against them an army of 60,000, among them an English brigade which had just returned from the persecution of the Vaudois. A policy of extermination was commenced, and in the upper Cevennes alone 466 villages were burned, and nearly the entire population put to the sword. In this bloody work the pope, Clement XI., assisted by issuing a bull against the "execrable race of the ancient Albigenses," promising remission of sins to the holy militia which was now formed among the Roman Catholic population under the name of cadets of the cross. The formidable force brought against them induced Cavalier to listen to proposals, and he finally assented to a surrender on being guaranteed liberty of conscience, the right of assembly outside of walled towns, the liberation of all his people then in durance, and the restitution to emigrants of their civil rights and property. Still, the greater part of the army, under Roland, Ravenel, and Joany, refused, and insisted upon the complete restoration of the edict of Nantes. They continued the war until the beginning of 1705, by which time their leaders were killed or dispersed and they became disorganized. In 1711 all outward signs of the reformed religion had disappeared, and Mar. 8, 1715, a few months before his death, Louis XIV., by a special medal and by proclamation announced the entire extinction of heresy. Fourteen years afterward, in spite of the strictest surveillance aided by military occupation, there had been organized in Languedoc 120 churches, which were attended by 200,000 Protestants. Persecution could not secure suppression, but it was not until 1775 that the last galley slave from Languedoc was liberated, and not till 1789 that the national assembly repealed all the penal laws against Protestanism.

There was a singular psychologic or spiritual phase in the history of the C. that must be noticed. It was a sort of inspiration or ecstasy. The subject, who had endured long fasting, became pale, and fell insensible to the ground. Then came violent agitations of the limbs and the head; and finally the patient, who might be a little child, a woman, or a half-witted person, began to speak in good French of the Huguenot Bible, warning the people to repentance, prophesying the immediate coming of the Lord in judgment, and claiming that these exhortations came directly from the Holy Ghost. After a long discourse the patient returned to his native patois with no recollection of what he had been doing or saying. All kinds of miracles, so they believed, attended upon the Camisards. Strange lights guided them to places of safety, unknown voices spoke encouragement, and wounds were often harmless. Those who were in the ecstasy of trance fell from trees without sustaining hurt; they shed tears of blood, and they subsisted without food for nine days. The supernatural was a part of their life. Many judgments have been passed upon these phenomena. Flechier and Brueys, Roman Catholics, consider them the product of fasting and vanity, nourished by apocalyptic literature. Bertrand and Calmeil, physicians, speak of magnetism, hysteria, and epilepsy, and a prophetic mania based on belief in divine possession. Most Protestants are content with the epithet "ecstasy," while semi-radical Roman Catholics consider the whole business the work of the devil.

CAMISARDS. See CEVENNES.

CAMLET (from Arab. *chamal*, fine) is properly a fabric made from the hair of the Angora goat (q.v.). The camlets made in Britain are either wholly of wool, or of wool mixed with cotton or linen, and spun hard.

CAM'MERHOFF, JOHN FREDERICK, 1721–51; b. in Germany, and one of the first Moravian bishops in America, where he arrived in 1746, as assistant to the bishop then presiding. He won the confidence of the Indians, with whom he was a great favorite. In 1750, he attended an important Iroquois council at Onondaga, N. Y., making a canoe journey of 13 days up the Susquehanna, and going thence on foot through the wilderness, an exertion which ruined his health.

CAMOENS, LUIS DE, the epic poet of Portugal, was b. about 1524, at Lisbon, and studied the ancient classics at Coimbra. On his return to Lisbon, he fell in love with a lady of honor, Catharina d'Atayada. This affair was the beginning of all the poet's misfortunes. Having been banished by royal authority to Santarem, C. joined the expedition of John III. against Morocco, and lost his right eye in a naval engagement with the Moors in the strait of Gibraltar. On his return to Lisbon, his bravery as a soldier was no more honored than his genius as a poet. Disappointed in all his hopes, he determined to leave forever his native land, and sailed for India, 1553. Offended by certain abuses of the Portuguese authorities in India, C. ventured to expose them in a satire, entitled *Disparates na India*, "Follies in India," in which he treated even the viceroy with ridicule. For this offense the poet was banished, 1556, to Macao, where he lived several years, and was engaged in writing *Os Lusiadas*. Here C. held the unpoetical but probably lucrative post of administrator of the effects of deceased persons; and having

saved, as he thought, a competency for his future life, was recalled from his banishment, 1561. Unhappily, in returning to Goa, he suffered shipwreck, and lost all his property, excepting his epic poem. After other wanderings and misfortunes, C. took ship for Lisbon, where he arrived in 1569, with no other wealth but his epic. He dedicated *The Lusiad* to the young king, Sebastian, who was very gracious; but, nevertheless, all the real patronage bestowed on C. consisted of a very small pension (about £4), and permission to remain at the court of Lisbon. Even this small pittance was taken away after the death of Sebastian, and C. was left in such poverty, that a faithful Indian servant begged in the streets of Lisbon for the support of the great epic poet of Portugal. C.'s lyric poems, written during this time of destitution, contain many pathetic lamentations. He died obscurely in the hospital at Lisbon, 1579; and 16 years afterwards, when it was proposed to erect a splendid monument to his memory, there was some difficulty in finding his burial-place.

The Lusiad (*Os Lusiadas*, "the Lusitanians") celebrates the chief events in the history of Portugal, and is remarkable as the only modern epic poem which is pervaded by anything like the true national and popular spirit of ancient epic poems. It is a gallery of epic pictures, in which all the great achievements of Portuguese heroism are represented. Among the most famous passages are the tragical story of Inez de Castro, and the apparition of the giant Adamastor, who appears as the Spirit of the Storm to Vasco da Gama, when crossing the cape. The versification of *The Lusiad* is extremely charming. Patriotic sentiments pervade the whole work. Besides his epic poem, C. wrote sonnets, odes, elegies, eclogues, epigrams, satires, epistles, and three comedies—*Os Amphitryoes* (after Plautus), *King Seleucus*, and *Filodemo*. The latest and best complete edition of his poems appeared in three volumes (Hamburg, 1834). The best edition of *The Lusiad* was published in Paris (1817), reprinted in 1819, and again, with emendations by Berdier, in 1823. *The Lusiad* has been translated into Spanish, French, Italian, English, Polish, and German.

CAMOGLIA, a t. of n. Italy, on the gulf of Genoa, about 13 m. e.s.e. of the city of that name. Its inhabitants, amounting, in 1872, to 6,345, are chiefly engaged in fishing.

CAM'OMILE. See CHAMOMILE.

CAMOR'RA, the name of a secret society, existing throughout all parts of the former kingdom of Naples, the members of which are called *camorristi*, and have exercised lawless force to a great extent over the humbler classes of society. Under the Bourbons, they openly presented themselves at markets, hackney-coach stations, public spectacles, and all occasions of popular amusement; assumed the right of deciding disputes; extorted a portion of whatever money passed from hand to hand for purchases, rents, wages, and the like, or in games; undertook also the transport of smuggled goods, and contracted for the commission of serious crimes. Their readiness for violence and murder, and their close association among themselves, made them so much dreaded, that even camorristi who had been thrown into prison, succeeded in exacting money from their fellow-prisoners, and from the jailer himself. The society has a central rendezvous in every large provincial town, and twelve such in the city of Naples. Those who belong to each of these sections of the society are under the absolute government of a chief elected by themselves, with whom is associated a treasurer. The latter has the charge of the common fund into which all the camorristi of that section pay their whole gains, for equal distribution among all their associates. Candidates for membership must show that they have neither been guilty of espionage nor theft; also, that neither their wives nor their sisters are prostitutes; and must swear upon an iron crucifix a fearful oath of fidelity and secrecy. The candidate remains for a year, with the designation of *picciotto d'onore*, as a pupil under an old camorrista; and having completed this probation, and given proof of his courage and obedience in circumstances involving danger of life, he is advanced to the rank of a *picciotto di sgarro*. Finally, after a longer period, and when he has given proof of his fitness on a number of occasions, he is admitted to full membership of the society as a *camorrista*. Each camorrista carries about with him two knives of peculiar form, by which the members of the society recognize each other. They are held under the strictest discipline. Disobedience is punished by flogging, suspension from employment, or expulsion; treachery, even on the part of a member who has been expelled, is punished with death. If two camorristi quarrel, their chief decides the question between them; but in difficult cases, a duel with daggers is the mode of decision. Under king Ferdinand II. the C. was tolerated for political reasons. The government of Francis II. endeavored to put down the society, and the police received instructions to seize and transport all known members of it. Those who remained entered into alliance with the Garibaldi committee, and rendered essential service in the expulsion of the Bourbons. An attempt was now made to employ them in the police service, but completely failed. The C. having fallen out with the new government, the members of the society now chiefly live by robbery in s. Italy.—See Monnier, *La Camorra, Notizie Storiche* (Flor. 1863).

CAM'OUFLET, in military pyrotechny, is a stinking composition inclosed in paper-cases. It is used in siege-works, to blow into the faces of the sappers and miners, when hostile parties come within reach of each other, and thus to confuse them.

CAMP (Fr., from Lat. *campus*, a plain, or level field). The signification of this word in English is rather that which belonged to the Latin *castrum*, an encampment, or *castra*, a collection of tents, huts, and other structures, for the accommodation and protection of troops, than that which its etymology would more directly indicate. The regular system of encampment ultimately adopted by the Romans, was forced upon them by degrees. The most complete account of it is furnished to us by Polybius. A plan will be found in Dr. Smith's *Dictionary of Greek and Roman Antiquities*, constructed for the purpose of illustrating his description. When a Roman army was about to encamp, a tribune and several centurions were sent on before, to select a suitable site for the purpose. As soon as the locality was determined on, they chose the spot for the prætorium or general's tent, and marked it with a white flag. Around the prætorium, as a sort of center or heart to the whole system, the rest of the C. was laid out. It was generally placed on an elevated position, in order that the general might have the rest of the encampment under his eye, and be able to transmit his orders with greater facility. Polybius himself tells us, that the best conception which can be formed of a Roman C. of the more permanent kind is by regarding it as a military town, resembling in many respects no doubt that which has recently grown up at Aldershot (q.v.). The streets were broader than those usually to be found in towns, the wider ones measuring 100, and the narrower 50 ft.; and the *forum*, as its name indicates, was a sort of public market-place. A space of 200 ft. was left vacant all round between the tents and the ramparts, partly to afford space for the arrangements of the army, and for stowing away any booty that might be captured, but chiefly to protect the soldiers' huts from incendiary attempts from without. In form, the Roman C. was square, except in the case in which it was intended to embrace within its ramparts four legions, or two consular armies, when it became an oblong rectangle. The C. was surrounded by a fosse or trench (*fossa*), which was generally 9 ft. deep and 12 broad. On the top of the rampart, which was of earth, there were stakes. The labor of constructing the rampart and the fosse was divided between the allies and the Roman legions, the former making the sides along which they were stationed, and the legions the rest. The task of superintending the construction of the C. amongst the Romans was intrusted to the tribunes; amongst the allies, to the prefects. Before the arrival of the troops, the different parts of the C. were so distinctly marked out and measured off, that they at once proceeded to their respective stations, as if they had entered a well-known city, and were marching to their quarters. The discipline of the C. was of the strictest kind. The tribunes administered an oath against theft both to freemen and slaves, and two maniples were chosen to keep the *via principalis*, which was a place of general resort, clean and in good repair. The other occupations connected with the C., too numerous to be mentioned here, were portioned out in like manner; and the superintendence of the whole was intrusted to two tribunes chosen by lot from each legion, and appointed to serve for two months. The prefects of the allies possessed a similar authority, which, however, seems to have been limited to their own troops, Every morning at daybreak, the centurions and horsemen presented themselves to the tribunes, and these, in their turn, received their orders from the consul. The watchword for the night, marked on a four-cornered piece of wood, was given out with much formality. The night was divided into four watches, each of three hours' length; and there was a curious arrangement for ascertaining that guard was kept with vigilance. The soldiers of the watch companies received from the tribune a number of small tablets, with certain marks upon them, and these tablets were collected during the night by the horsemen whose duty it was to visit the posts, from such of the guards as they found on duty. Where these inspectors found the guards asleep or absent, they called upon the bystanders to witness the fact, and then passed on to the next. In the morning, the inspectors appeared before the tribunes, and gave up the tablets they had received, when the guards whose tablets were not produced were required to account for them. A regular scale of rewards and punishments was established in the camp. In comparing the encampments of the Romans with those of his own countrymen, Polybius tells us that the Greeks trusted mainly to a judicious selection of their ground, and regarded the natural advantages which they thus secured as supplying in a great measure the place of artificial means of defense. The Greeks, consequently, had no regular form of C., and no fixed places were assigned to the different divisions of the army. When the practice of drawing up the army according to cohorts, introduced by Marius and Cæsar, was adopted, the internal arrangements of the C. experienced a corresponding change. Latterly, even the square form was abandoned, and the C. was made to suit the nature of the ground. It was always held to be of importance, however, that the C. occupied a defensible position; that it could not be overlooked; and that it had a command of water.

When stationary camps (*castra stativa*) came into more general use, we hear of several parts which are not mentioned by Polybius, for example, the infirmary (*valetudinarium*), the farriery (*veterinarium*), the forge (*fabrica*), etc.; and as a great variety of troops then came to be employed, they must, of course, have had new stations appointed to them in the camp. Many of the stationary camps ultimately became towns, and to this is ascribed the origin of most of the towns in England the names of which end in *cester* or *chester*. Amongst the most perfect of those which retained the form of the simple

encampment, is that at Ardoch in Strathearn, Perthshire, in the grass-covered mounds and ridges of which most of the divisions of the C. have been distinctly traced by antiquaries. For further information on this subject, the reader is referred to gen. Roy's *Military Antiquities in Great Britain*, and the *Caledonia Romana* of the late Mr. Robert Stuart. In these works will be found ample accounts of some of the more remarkable Roman camps in Britain; those described by Roy being rendered intelligible by large engravings.

It is believed that, during the middle ages, the plan adopted by the Romans in their camps was more or less adhered to, seeing that the weapons employed, which mainly determined the character of the troops, were nearly the same. In Britain, before the arrival of the Romans, and also during the Saxon and Danish periods, the camps, usually circular in form, appear to have been somewhat rude in character, with the cavalry grouped round the standard in the center, and the infantry placed near the front.

The principles of castrametation, or camp-formation, underwent much change after the invention of gunpowder, owing to the necessity for defending the C. from artillery. Modern camps, of different kinds, will be found described under ENCAMPMENT.

CAMP : co. Tex. See page 887.

CAMPAGNA, a t. of Italy, in the province of Salerno, is situated between high mountains, about 20 m. e. of Salerno. It has a fine cathedral, several convents, and a large annual fair. Pop. '72, 9813.

CAMPAGNA DI ROMA, an undulating, uncultivated, and unhealthy plain of Italy surrounding Rome, including the greatest part of ancient *Latium*, and forming the late papal delegation of Frosinone and a great part of the Comarca di Roma. Its length is variously stated, arising from the fact that different authorities measure it from different points. But supposing the name to apply to the district extending from cape Linaro, s. of Civita Vecchia, to Terracina, beyond the Pontine marshes, its length is about 90 m.; and its breadth inland, to the Alban and Sabine hills, is stated at from 27 to 40 miles. A broad strip of sandy plain skirts the Mediterranean. The ground, which never rises above 200 ft. above the sea, is almost entirely volcanic, and the lakes are formed by craters of extinct volcanoes. The vapors rising from this district, and especially from the Solfatara (q.v.), produce the pestilential atmosphere styled *aria cattiva*. The number of inhabitants is very small, and in summer they are driven from the C. by its pestilent air, and seek shelter in Rome and other neighboring places. In autumn, herdsmen descend from the Apennines to the C. with their herds, the pasturage in some parts being rich and abundant. This district was not always uncultivated and depopulated as we now find it, for Domitian and Hadrian built here their splendid villas. Wars and devastations, the "black-death" (q.v.) in the 14th c., which greatly thinned the population, and inundations from the Tiber, have been the main causes of the present state of the C.; but, according to Livy, it was always an unhealthy district, even when well cultivated. Some of the popes, especially Pius VI., have endeavored to drain the Pontine marshes, and, during the dominion of the French in Italy, gen. Miollis made great improvements in drainage, timber-planting, and cultivation in the Campagna. Since '68, the government has done much to reclaim the C.

CAMPAIGN generally means a connected series of military operations, forming a distinct stage or step in a war. Under the old system of warfare, when armies kept the field only during the summer months, a C. was understood to include all that was done by an army from the time it took the field till it went again into winter-quarters. Now that winter is no longer allowed to arrest military operations, it is more difficult to say where one C. ends and another begins. Some writers make a C. include all the steps taken to accomplish some one immediate object.

CAMPAN, a t. in France, in the department of Hautes-Pyrenees, 18 m. s.e. of Tarbes; pop. 3700. It is in a valley of the same name, on the Adour, and is noted for picturesque scenery, for a stalactite grotto, and marble quarries, along the road to Bagnères de Bigorre. Some of the finest of colored marbles, with green, flesh-colored, red, and white veins, are found here. The women are employed in knitting scarfs and wonderfully thin gauze from fine wool brought from Spain.

CAMPAN, JEANNE LOUISE HENRIETTE, reader to the daughters of Louis XV., was b. in Paris, Oct. 6, 1752. She was favored by Marie Antoinette, and gave her royal patroness numerous proofs of her fidelity. When the unfortunate queen was conveyed to the Temple, she wished to share her captivity, but was refused entrance by Petion. During the reign of terror, she remained concealed at Combertin. After the fall of Robespierre, she opened a boarding-school at St. Germain-en-Laye, which was patronized by Josephine Beauharnais, who sent her daughter Hortense to it. In 1806, Napoleon appointed her lady-superintendent of the institution at Ecouen for the education of the daughters of the officers of the legion of honor. After the restoration, this institution was suppressed, and Mme C. retired to Mantes, where she died, May 16, 1822. She is chiefly remembered on account of her interesting works—*Mémoires sur la Vie Privée de la Reine Marie Antoinette* (4 vols., 5th ed., Par. 1824); *Journal Anecdotique* (Par. 1824); and *Correspondance Inédite avec la Reine Hortense* (2 vols., Par. 1835)—giving recollections of the court of Louis XV., of Marie Antoinette, the revolution, and some traits from the private character of Napoleon.

CAMPANA, La, a t. of Andalusia, Spain, situated on the Madre-Viega, a tributary of the Guadalquivir, about 37 m. e.n.e. of Seville. The inhabitants, numbering 5,380, are engaged chiefly in agricultural pursuits, and in weaving and brick-making.

CAMPANA'RIO, a t. of Estremadura, Spain, about 62 m. e.s.e of Badajos. It is an ill-built place, with narrow, uncared-for streets. It has manufactures of linens and ropes, and a trade in the agricultural produce of the neighborhood. Pop. 5,400.

CAMPANELLA, Tomma'so, a Dominican monk celebrated for his philosophical ability, was b. in 1568 at Stilo in Calabria, and studied in Naples and Cosenza. The writings of Telesius first awakened his doubts respecting that pile of artificial dogmas styled the "scholastic philosophy." The results of his studies were given in his *Philosophia Sensibus Demonstrata*, etc. (Naples, 1591), which contained a defense of Telesius. His superiority in disputations exposed him to the hatred and false accusations of the orthodox monks and schoolmen. He was in consequence compelled to flee from Naples to Rome, and thence to Florence, Venice, and Bologna. Afterwards, he returned to Calabria, but having involved himself in a political conspiracy, he was seized and confined in a Neapolitan dungeon for 27 years; tried five times, and tortured seven; accused of heresy; and declared the author of a book which had been published thirty years before he was born. In 1626, pope Urban VIII. had him brought to the prison of the inquisition at Rome, but immediately liberated him, and treated him in a very generous manner. After being again persecuted by the Spanish government, C., who had formed the friendship of the French ambassador at Rome, the duc de Noailles, obtained a letter of introduction to cardinal Richelieu, and secretly left for France, where he was graciously received. He died in the Dominican monastery of St. Honoré, near Paris, 1639. Most of his works—*De Gentilismo non Retinendo* (Paris, 1636); *Astrologicorum Libri VII.* (Lyons, 1629); *Prodromus Philosophiæ Instaurandæ* (Frankfort, 1617); *Exordium Metaphysicæ Novæ, De Sensu Rerum et Magia* (Frankfort, 1620)—were written during his imprisonment. His philosophical views give expression to that confused fermentation of new ideas which was characteristic of the close of the 16th and opening of the 17th c. —bold and clear opinions strangely mingled with commonplaces and with astrological dreams and fancies. It may seem strange that C. should have been patronized by the pope; but this favor was gained, not by his speculative works, but by several writings in defense of the Roman Catholic church. His *De Monarchia Hispanica Discursus* is a work of great power and value, comprising a sketch of the political world of C.'s time, with special reference to Spain. It was translated into English during Cromwell's protectorate.

CAMPAN'HA, a t. of Brazil, about 150 m. n.w. of Rio de Janeiro, surrounded by bare hills, much cut up by gold-mines. The houses are built chiefly of earth, and surrounded by gardens. C. has several churches, a Latin school, a hospital, theater, etc. Pop. 6,000.

CAMPANIA, anciently a province of central Italy, having Capua as its capital (now subdivided into the provinces of Benevento, Naples, Salerno, Avellino, and Caserta), was bounded on the s. by Lucania, e. by Samnium, n. by Latium, and w. by the Tyrrhenian sea. It was one of the most productive plains in the world, producing in extraordinary abundance corn, wine, and oil; and both by Greek and Roman writers is celebrated for its soft and genial climate, its landscapes, and its harbors. It was the *regio felix* of the Romans, who built here many of their most splendid villas, etc. Through it passed the Appian Way, the greatest high-road of Italy. The promontory Misenum, Mt. Vesuvius, the river Vulturnus, the towns Baiæ, Cumæ, Linternum, Puteoli, Naples, Herculaneum, Pompeii, Nola, Salernum, Capua, etc., belonged to Campania. It was the oldest Greek settlement in Italy, having been colonized, according to the later chronologers, about 1050 B.C.; but this is in all probability too early a date. It was next conquered by the Etruscans, and several of the towns above mentioned, such as Capua and Nola, were founded by that people. The Etruscans then succumbed to the more warlike and hardy Samnites, who, in their turn, yielded to the irresistible valor of Rome (340 B.C.). Through all these vicissitudes of conquest, the substratum of the people remained as at the beginning. The mass of the Campanians were essentially of Oscan race, and Oscan they remained. Indeed, it is mainly from them that our knowledge of the Oscan language is derived, and one of their towns—Atella, between Capua and Naples—had the honor of introducing upon the early Roman stage a species of popular drama or comedy, which was greatly relished for its quaint and vigorous humor. See Atellanæ.

CAMPA'NI-ALIMENIS, Matteo, an Italian philosopher and mechanician of the 17th century. He was a curate in Rome, but devoted his time mainly to scientific pursuits, constructing the object-glasses with which two of Saturn's satellites were discovered; making illuminated and noiseless clocks; and attempting to correct the variations of the pendulum due to temperature. He published a work on horology. Giuseppe, a younger brother, was also an optician and astronomer of some eminence.

CAMPANILE (Ital., from Mid. Lat. *campana*, a bell), a name adopted from the Italian to signify a bell-tower of the larger kind, and usually applied only to such as are

detached from the church. Scarcely any of the existing bell-towers of England answer to the Italian conception of the C., but it is said that there was a very fine one at Salisbury, 200 ft. in height, which was destroyed by Wyatt. In Italy, they are found everywhere—at Bologna, Padua, Ravenna, Cremona, Venice. Perhaps the most remarkable are the so-called "leaning tower" of Pisa, and the C. of Florence. The former, which is circular in form, is decorated with columns and arcades to the summit of its eight stories, and presents a very imposing appearance, reminding the traveler of the Coliseum at Rome, from which, and the now destroyed Septizonium, the idea of it is said to have been taken by the architects Bonano of Pisa, and Wilhelm of Innspruck. But though less curious, the famous C. of Giotto is perhaps even more worthy of the traveler's attention. It was erected in 1334, with the express object of surpassing, both in height and in richness of workmanship, any of the remains of antiquity. In form, it is a parallelopiped, and is of the same dimensions from bottom to top. Though it is very lofty—267 ft.—it consists of only four stories, of which the tallest are the uppermost and undermost; and the windows in the upper story are rather larger than those in the two beneath, the object being to counteract the diminution to the eye occasioned by the greater distance. The effect of this arrangement has been much praised by architects; but there seems ground for skepticism as to its advantages. The style is the real Italian Gothic, which unites simplicity with great richness of ornamentation. The original design of Giotto was that a spire of 100 braccia in height should have surmounted the present structure, and on the summit may be seen the four great piers from which it was intended that it should have risen. The splendid C. of Florence, in its present condition, must thus be regarded only as a fragment. There is a fine C. at Seville, 350 ft. in height, which was built by Guever the Moor in 1568. It is called La Giralda, from a brazen figure, which, though it weighs a ton and a half, turns with the wind.

CAMPANI'NI, Italo, b. Parma, 1846; an Italian tenor. He enlisted in the army of Garibaldi when fourteen years of age, and took part in the fight before Milazzo. Having discovered during the campaign that he had a wonderful voice, he studied singing for two years at the conservatory of Parma, and made his first appearance as the notary in *La Sonnambula* at one of the theaters of his native town. He sang with very little success with different opera companies till 1869. In that year he went to Milan and placed himself under the tuition of the celebrated teacher, Francesco Lamperti. After a thorough training he made his debut in *Faust* at La Scala of Milan, and was pronounced by a critical audience to be one of the finest tenors of the age. In 1872, he made his London debut as "Genaro," in *Lucrezia Borgia*, and in 1873 sang with Christine Nilsson in New York. He returned to America during the season of 1879–80. Besides being the greatest tenor living, he is remarkable for the immense scope of his repertory, which includes nearly 80 operas, the tenor rôles of which he can sing at a few hours' notice.

CAMPANULA (Lat., a little bell), a genus of plants of the natural order *campanulaceæ* (q.v.), distinguished by a bell-shaped corolla with five broad short segments, filaments dilated at the base, a 2 to 5 cleft stigma, and a top-shaped capsule with 2 to 5 cells, opening by lateral clefts below the calyx segments. The species are very numerous, chiefly but not exclusively abounding in the northern parts of the world, and the more elevated districts of the temperate zones. They are mostly herbaceous, some of them annual. The name Bell-flower is common to many of them, and is often extended to all. The flowers are in general beautiful, and many of the species are therefore frequent ornaments of flower-borders. Of the native British species, the most common, and one of the most beautiful, is the harebell (q.v.), or Bluebell (*C. rotundifolia*). The Canterbury Bell (*C. medium*) is a very beautiful annual, which has long been so generally sown in flower-borders in Britain, that it is almost as familiar to every one as the most common field-flowers. It is a native of the central parts of Europe.—Medicinal virtues were formerly ascribed to some species, particularly in affections of the throat, wherefore *C. trachelium*, frequent in woods in England, has received the name of throatwort; but they are now regarded as inert. —The roots of some are reckoned among esculents, as those of the rampion (q.v.) (*C. rapunculus*), occasionally cultivated in Britain, and much more generally in some parts of continental Europe.

CAMPANULA'CEÆ, a natural order of exogenous plants, herbaceous or half shrubby, with a bitter milky juice; leaves without stipules, and generally alternate; the calyx usually 5-lobed, its tube adhering to the ovary; the corolla monopetalous. inserted into the top of the calyx, usually 5-lobed and regular; the stamens inserted into the calyx, and alternate with the lobes of the corolla; the fruit with two or more many-seeded cells, crowned with the withered calyx and corolla, and opening by division of the cells (*loculicidally*); the seeds fixed to the axis, and having fleshy albumen. About 500 species are known, natives chiefly of the temperate and colder climates of the northern hemisphere, where their blue or white flowers are among the finest ornaments of fields and woods. The roots and young leaves of some species are eatable, as is the half-fleshy fruit of *canarina campanula*, a native of the Canary islands.

CAMPBELL: co. Dak. See page 887.

CAMPBELL, a co. in n.w. Georgia, on the Chattahoochie river and the Atlantic and Westpoint railroad; 360 sq.m.; pop. '80, 9979—3890 colored. Among its minerals are gold and iron. Productions, corn, wheat, and cotton. Co. seat, Campbellton.

CAMPBELL, a co. in n. Kentucky, on the Ohio and Licking rivers; 120 sq.m.; pop. '80, 37,440—448 colored. The surface is level in the bottom lands, and undulating away from the rivers; soil generally fertile, producing grain, tobacco, etc. Co. seat, Alexandria.

CAMPBELL, a co. in n.e. Tennessee, on the Kentucky border; watered by Clinch river; 450 sq.m.; pop.'80, 10,005—434 colored. It has a rough surface, and is traversed by a spur of the Cumberland mountains, and is to a large extent covered with forests. It produces corn, wheat, and sugar. Co. seat, Jacksonbourgh.

CAMPBELL, a co. in s. Virginia, between James and Staunton rivers, intersected by the Atlantic, Mississippi and Ohio railroad; 576 sq.m.; pop. '80, 36,250—18,954 colored. It has an uneven surface, and fertile soil; producing tobacco, corn, wheat, etc. Co. seat, Campbell Court-house.

CAMPBELL, the family name of the lords of Argyle. The origin of the family has not been satistactorily ascertained. One theory makes it of Anglo-Norman origin; another traces its descent through a long line of Celtic chiefs to king Arthur. It first appears in record towards the end of the 13th c., when it held lands in Ayrshire and Argyle. The chiefs of the family having taken a prominent part in public affairs, the most distinguished are noticed under the head ARGYLE.

CAMPBELL, ALEXANDER, D.D., 1786-1866; b. in Ireland; educated at Glasgow university, and came to the United States in 1809, settling in Bethany, Penn., as pastor of a Presbyterian church, from which he soon departed and organized a society whose doctrine was that the Bible should be the sole creed of the church. His followers increased, and are now known as "Disciples of Christ," or "Campbellites," and number about half a million. Dr. C. was the author of many works on religious subjects, and held important controversies with such disputants as Robert Owen, archbishop Purcell, Rev. N. L. Rice, and Rev. Wm. McCalla. See DISCIPLES OF CHRIST.

CAMPBELL, ALLAN. See page 887.

CAMPBELL, ARCHIBALD. See ARGYLE, DUKE OF, *ante.*

CAMPBELL, BARTLEY. See page 887.

CAMPBELL, Sir COLIN, Lord CLYDE, one of the bravest soldiers and most distinguished generals of modern times, was born in Glasgow, in 1792. His father was a cabinet-maker, named John Macliver, but Colin assumed the name of Campbell, to gratify an uncle on the mother's side. He entered the army as an ensign in 1808; fought through the war in the Spanish penisula with distinction, and took part in the expedition to the United States in 1814. In 1842, he attained the rank of col., and in the same year he was present at the attack on Chusan, in China, and for his services there received honorable mention in the *Gazette.* He next served in the Punjab, commanding the left at the battle of Chillianwallah. For his conduct in this battle, lord Gough awarded him the highest praise in his dispatch to the governor-general of India. He next commanded in the Peshawur district, with uniform success against the hill-tribes. On the breaking out of the Crimean war in 1854, he was appointed to the command of the Highland brigade, and took a prominent part at the battle of the Alma; and afterwards at Balaklava, where, with the 93d Highlanders, which he did not even form into square, he beat back the Russian cavalry, who were swooping down on the port, with its accumulation of shipping and stores. His services in this war were rewarded with promotion to the rank of maj.gen., and he was also created a knight grand cross of the order of the bath, and received the cross of the French legion of honor. He was appointed inspector-gen. of infantry, and in 1857, commander of the forces in India, then engaged in quelling the Indian mutiny, which by his energy and judgment was soon utterly subdued. One of the most notable characteristics of C.'s generalship, was the care he took of the lives of his men, all his victories being won with the minimum expenditure of the blood of his soldiers. For his exploits in India, C., in 1858, was created a peer of the realm, with the title of baron Clyde, and appointed a gen., the East India company granting him an annuity of £2000. C. arrived in Britain from India in 1860, and died Aug., 1863.

CAMPBELL, GEORGE, D.D., an eminent theological writer, was born at Aberdeen in 1719. He was educated for the law, but abandoned that profession for the study of divinity. In 1746, he was ordained minister of Banchory Ternan, a parish lying some miles s.w. of Aberdeen; and in 1759, he was appointed principal of Marischal college. His first work was his famous *Treatise on Miracles,* in answer to Hume. The dispute concerning miracles has assumed a new form in the present century, and C.'s arguments would not meet all the objections which the modern school of rationalists urge; but the work in its own day was greatly admired, and characterized as "one of the most acute and convincing treatises that has ever appeared on the subject." It was speedily translated into French, Dutch, and German. In 1771, C. was elected professor of divinity in Marischal college. In 1776, he published his *Philosophy of Rhetoric,* which is still a standard work on the subject. His last work was a *Translation of the Gospels, with Preliminary Dissertations and Notes.* He died April 6, 1796. After his death appeared his *Lectures on Ecclesiastical History.*

CAMPBELL, JOHN (CAMPBELL), Lord, high chancellor of England, son of a minister of Cupar, in the co. of Fife, Scotland, was born in 1779. He was at first destined to follow his father's profession, and was sent, while still a mere boy, to the neighboring univer-

sity of St. Andrews. C. himself had no inclination for a clerical life, and when he had completed his studies in the faculty of arts, he left for London, being then about 19 years of age. He obtained employment on the staff of the *Morning Chronicle*, where, in due time, he was intrusted with the care of the theatrical criticism and the reports in the house of commons. He was called to the bar in 1806. His sound sense, and unpretending activity and devotion to business, were awarded with an extensive common-law practice, and, after a time, with professional promotion. The silk-gown of a king's counsel was conferred upon him in 1827. Three years afterwards, he entered parliament, actuated, he tells us in the preface to one of his works, by a desire to obtain for England the benefits of a national registry of titles to land. The effort, at the time, was unavailing, as the landlords, whom it was destined more immediately to benefit, completely misunderstood the purport of the project. C. was promoted by the Whig party, to which he had attached himself, to the solicitor-generalship in 1832, and to the attorney-generalship in 1834. In the same year, he was chosen the representative in parliament for Edinburgh. He continued to represent Edinburgh down to 1841, and remained in the office of attorney-general during that period, with the exception of the short time in 1835, when the conservatives were in power. In 1841, he was made chancellor of Ireland and a peer of the United Kingdom; but held the office of chancellor for only a few months, when the Melbourne cabinet left office, necessitating C. also to resign. For the first time since boyhood, he found himself without regular daily labor, and at the mature age of 60, set to work to win the literary fame which he professes always to have secretly coveted. His first publication was a collection of his speeches at the bar and in the house of commons. For three or four years after the publication of his speeches, C. was engaged in the preparation of the *Lives of the Chancellors*, the first series of which appeared in 1845. In 1846, he joined the Russell cabinet in the capacity of chancellor of the duchy of Lancaster. His ministerial duties were not sufficiently arduous to interrupt his literary labors, and he proceeded to complete the *Lives of the Chancellors*, and to publish a supplemental series of *Lives of the Chief-justices of England*. Both works have enjoyed great popularity, but leave no doubt that the author was more fitted for a practical lawyer than for a man of letters. C. returned to more congenial labors in 1850; he was then appointed to succeed Denman as chief-justice. He held the office for nine years, at the end of which he received the highest honor that can be obtained by a member of the legal profession—the chancellorship of England. He died June, 1861.

CAMPBELL, Thomas, a distinguished English poet, was b. in the city of Glasgow, 27th July, 1777. His father was a merchant, and the poet was the youngest of ten children. He was sent to the university of his native city, and remained there six years. During his collegiate course, he received several prizes, and was particularly distinguished for his knowledge of Greek literature. On leaving the university, C. went to reside as a tutor for a year in the island of Mull. The scenery of the w. Highlands made a deep impression on his mind, and to his abode in these grand and desolate regions we are indebted for many of the touches of sublimity which occur in his verses. Returning from Argyleshire, C. meditated the study of law, and repaired to Edinburgh; but he could not shake off his recollections. In his eyes, the mists were folded on the hills of Morven, the roar of Corrievrekin was in his ears, and instead of prosecuting the study of jurisprudence, he wrote *The Pleasures of Hope*. The poem was published in 1799, and went through four editions in a twelvemonth. After its publication, C. went to the continent; and on Dec. 3, 1800, witnessed from a Bavarian monastery the battle of Hohenlinden, fought between the French and Austrians. In 1801, he returned to England with *The Exile of Erin* and *Ye Mariners of England* in his portmanteau; and shortly after, took up his abode in Edinburgh, where *Locheil's Warning* was composed. In 1803, C. proceeded to London, and adopted literature as a profession. He contributed articles to *The Edinburgh Encyclopædia*, and compiled *The Annals of Great Britain from the Accession of George II. to the Peace of Amiens*, in 3 vols. In 1806, through the influence of Mr. Fox, C. received a pension of £200 per annum from government. In 1809, he published *Gertrude of Wyoming*, which bears the same relation to *The Pleasures of Hope* that *The Castle of Indolence* bears to *The Seasons*—a less brilliant and striking, but more mature and finished performance. In 1818, C. was again in Germany, and on his return, he published his *Specimens of the British Poets*, in 7 vols. In 1820, he delivered a course of lectures on poetry at the Surrey institution. From this date to 1830, C. edited *The New Monthly Magazine*, and contributed thereto several poems, one of which, *The Last Man*, is in some respects the loftiest of all his performances. In 1824, he published *Theodoric and other Poems*. In 1827, he was elected lord rector of the university of Glasgow, and received the unusual honor of re-election the two following years. He published *The Pilgrim of Glencoe and other Poems* in 1842. His later publications did not add to his fame. He died at Boulogne, in 1844, and was buried in Westminster abbey, Macaulay, dean Milman, and other celebrated persons bearing the pall.

C. is an established English classic. With the young, *The Pleasures of Hope* will ever be a chief favorite; while readers of maturer years will linger with delight over the sylvan scenery and tender domestic scenes of *Gertrude*. It is in his lyrics, however, that C. has ascended highest into the heavens of song—*Hohenlinden; Ye Mariners of England;* and *The Battle of the Baltic*, cannot be paralleled in the language. Than these lyrics,

nothing can be more simple and spirited. Once read, they cannot be forgotten. They will fan the patriotism of many generations.

CAMPBELL, William, 1745–81; b. in Va.; an officer in the revolutionary war. He was among the earliest of the patriot troops from that colony, and was distinguished in the conflicts of King's mountain and Guilford, for which he was promoted to be brig.gen. He died in Lafayette's camp, just before the Yorktown surrender.

CAMPBELL, William, Lord, d. 1778; the last English governor of South Carolina. He was a capt. in the navy; a member of parliament in 1764; in 1766, governor of Nova Scotia, and 1775, of South Carolina. He was active in stirring up the Indians against the colonists, and was in the expedition led by sir Peter Parker against South Carolina, in the course of which he received the wound that caused his death.

CAMPBELL ISLAND, a lonely spot on the s. Pacific, in lat. 52° 33′ s., and long. 169° 9′ e. Though it is mountainous, and measures only 36 m. round, it is yet valuable on account of its harbors. It is also scientifically interesting, being volcanic, and displaying a rich and rare flora.

CAMPBELLITES. See Disciples of Christ.

CAMPBELTON, a royal burgh and seaport, on the e. coast, near the s. end of the peninsula of Cantire, Argyleshire, and the most important town in that co., is 65 m. w.s.w. of Glasgow, on a fine harbor or sea-loch, 2 m. long, and one mile broad. It is noted for the number—between 20 and 30—of its whisky distilleries. It unites with Ayr, Inverary, Irvine, and Oban to return one member to parliament. A sculptured granite cross stands in the principal street, and is supposed to have been brought from Iona. Pop. '81, 7693. The chief exports are whisky, herrings, and Highland cattle and sheep. In 1874, 806 British vessels of 6838 tons, and 18 foreign of 2353 tons, entered the port. C. is a favorite summer resort.

CAM'PE, Joachim Heinrich, 1746–1818; a German teacher educated at Halle in theology, and chaplain at Potsdam. In 1787, he was counselor of education in Brunswick, where he published books for schools, and established a prosperous business. His works on education have been widely circulated, not only in German, but in other languages.

CAMPEACHY, one of the states of Mexico occupying the s. part of the peninsula of Yucatan, and bordering on Guatemala and the Belize; 26,000 sq.m.; pop. about 90,000, of whom a large proportion are Indians. The soil is for the most part sandy and unproductive, but there are good pasture lands. The main productions are rice, sugar, and salt.

CAMPEA'CHY, a seaport on the w. side of the peninsula of Yucatan, which divides the Caribbean sea from the gulf of Mexico. It is in lat. 19° 50′ n., and long. 90° 33′ west. Though it has a shallow haven, yet it is the center of the trade in logwood; it exports likewise cotton and wax. It is a handsome city of 15,000 inhabitants, containing churches, convents, a cemetery, a theater, a college, and ship-building docks. *Campeche* is the Spanish spelling.

CAMPEG'GIO, or CAMPEGGI, Lorenzo, 1479–1539; in early life a lawyer, but on losing his wife he joined the Roman Catholic church and rapidly rose to the position of cardinal. In 1519, he was sent to England to preach a crusade against the Turks, but was unsuccessful. Henry VIII. made him bishop of Salisbury in 1524, and he came again to England in 1528 to assist Wolsey in the case of Henry's divorce from Catherine. He accomplished nothing, however, and the see of Salisbury was taken from him.

CAMP EQUIPAGE is a general name for all the tents, furniture, fittings, and utensils carried with an army, applicable to the domestic rather than the warlike wants of the soldier. In the days when armor was worn, the C. E. was enormously heavy and complicated. In the present day, a certain amount of C. E. is provided for a given number of troops. See Encampment, Tent, etc.

CAMPER, Peter, one of the most learned and acute physicians and anatomists of the 18th c., was born at Leyden, 11th May, 1722, and studied medicine there. In 1750, he became professor of medicine at Franeker; in 1755, at Amsterdam; and in 1765, at Groningen. In 1773, he resigned his post, resided some time at Franeker, and then traveled. On being elected a member of the state council in 1787, he removed to the Hague, where he died, 7th April, 1789. C. was distinguished not only for the services he rendered to anatomy, surgery, obstetrics, and medical jurisprudence, but also as a promoter of the fine arts. He was remarkably skillful in pen-and-ink drawing, painted in oil, embossed, and even acquired considerable experience as a sculptor. For his observations on the facial angle, see article Angle. His work on the connection of anatomy with the art of drawing was an important contribution to the theory of art. Another work, *Description Anatomique d'un Eléphant Mâle,* edited by his son, G. A. Camper, and published at Paris in 1802, is also worthy of notice. C.'s collected writings, with plates, appeared under the title, *Œuvres qui ont pour Objet l'Histoire Naturelle, la Physiologie et l'Anatomie comparée,* 3 vols. (Par. 1803).

CAMPERDOWN, a broad tract of low downs which separates the small hamlet of Camp, in North Holland, from the German ocean, about 30 m. n. from Haarlem. It is

known on account of the victory obtained, off that part of the coast, by admiral Duncan over the Dutch fleet, Oct. 11, 1797. The Dutch fleet under admiral Van Winter had stolen out of the Texel, with the view of joining the French fleet at Brest, when it was intercepted by admiral Duncan, and after an obstinate battle, attended with great loss on both sides, the Dutch admiral was compelled to yield, leaving 8 sail of the line and several smaller vessels in the hands of the English, himself becoming a prisoner.

CAMP FOLLOWERS are the sutlers and dealers in small-wares who follow an army. In India, owing to the peculiar habits and customs of the Hindus, and the large number of servants retained by English officers, the C. F. are in immense number: comprising servants, sutlers, cantiniers, hostlers, water-carriers, snake-charmers, dancers, conjurors, and women. In Feb., 1839, when a Bengal army of 15,000 men left Shikarpoor for Afghanistan, it was accompanied by no fewer than 85,000 C. F.; the commander took with him six weeks' food for the whole 100,000. All English commanders in India find this regulation a very burdensome one. Even in European armies, however, C. F. are regarded as necessary; they are under the control of the commanding officer, and are subject to the articles of war—not, however, in cantonments, only in the field. French armies are accompanied by women much more largely than English.

CAMP'HAUSEN, Wilhelm, b. 1818; a German painter whose specialty is battle pieces, to qualify for which he served as a volunteer in the army. Among his works are "Tilly at Breitenfeld," "Prince Eugene at Belgrade," "Godfrey de Bouillon at Ascalon," "Puritans watching the Enemy," "A Convoy of Prisoners of Cromwell's Camp," "Cavaliers and Roundheads," "Storming of an English Castle by Cromwell's Soldiers," "Charles II. in the Retreat from Worcester," "Charles I. at Naseby," etc. In 1859, he was made professor of historical painting in the Dusseldorf academy,

CAMPHENE, or Camphilene, is an artificial variety of camphor obtained from turpentine, by acting thereon with the dry vapor of hydrochloric acid, and keeping the whole at a low temperature by immersing the vessel in a freezing mixture. A solid substance is produced, which separates in white crystalline prisms, and has the taste and agreeable aromatic smell of common natural camphor. As prepared, it is strictly a hydrochlorate of C.; but the latter can be obtained free from hydrochloric acid, by passing the vapor of the compound substance over dry heated quicklime, when the acid is held by the lime, and pure C. passes over. It is not so similar to ordinary camphor when thus freed from the hydrochloric acid.

CAMPHINE is the name applied to a variety of spirit of turpentine obtained from the *pinus australis* of the southern states of America, and rather extensively sold and used in Britain for burning in out-of-door lamps. It is very volatile, and burns very freely, giving off a pure white brilliant light; and when the vapor diffuses itself through air, and is set fire to, it forms a dangerous and violently explosive mixture.

CAMPHOR is a solid essential oil which is found in many plants, and may be separated from many essential oils. It particularly abounds in certain species of the natural order *lauraceæ* (q.v.). Almost all the C. of commerce is the produce of the C. laurel or C. tree (*camphora officinarum*, formerly known as *laurus camphora*), a native of China, Japan, Formosa, and Cochin-China, and which has been introduced into Java and the West Indies. The genus *camphora* differs from *cinnamomum* (see Cinnamon) chiefly in having a thin instead of a leathery calyx. The C. laurel is a tree of considerable height, much branched, with lanceolate, evergreen leaves on short stalks, and small yellowish-white flowers in axillary and terminal panicles. The fruit is in size and appearance not unlike an imperfectly ripened black currant. Every part of the tree, but especially the flower, smells strongly of camphor. The wood is light and durable, not liable to be injured by insects, and much valued for carpenter's work. In the extraction of C. from the *C. laurel*, the wood of the stem and branches is chopped up into fragments, and introduced into a still with water, and heat applied, when the steam generated carries off the C. in vapor. These vapors rise, and in passing through rice-straw, with which the head of the still is filled, the C. solidifies, and is deposited round the straw in minute grains or particles, somewhat about the size of raw sugar or coarse sand. These grains of impure C. are detached, and being introduced into a large globular glass vessel in quantities of about 10 lbs., are reheated, when first the water rises in steam, and is allowed to escape at a small aperture; and thereafter, this aperture being closed, the C. sublimes and resolidifies in the interior upper part of the flask, as a semi-transparent cake, leaving all the impurities behind. The flasks are then cooled and broken by throwing cold water on them, and the C. taken out, and sent into market. The glass globes employed are called by an Italian name, *bomboloes*, the sublimation of C. having been first practiced in Venice.—C. was unknown to the Greeks and Romans, and was first brought to Europe by the Arabs. It is a white tough solid, slightly lighter than water, and floats thereon. It is very sparingly soluble in water, but freely soluble in alcohol, ether, acetic acid, and the essential oils. It fuses at 347°, and boils at 399°, and when set fire to, is very inflammable, and burns with a white smoky flame. Thrown upon water, it floats, and may be set fire to, when the currents generated alike from the solution in water and the irregular burning of the pieces, cause a curious rotatory motion. It has a peculiar hot aromatic taste, and an agreeable characteristic odor.

C. is used in medicine, both internally and externally, as a temporary stimulant. It is frequently employed in gout and rheumatism. In small doses, it acts as an anodyne and antispasmodic; in very large doses, it is an irritant poison. It is generally reckoned an anaphrodisiac. Its alcoholic solution and liniments in which it is the principal ingredient, are much used for external application in sprains and bruises, chilblains, chronic rheumatism, and paralysis.—The effluvia of C. are very noxious to insects, and it is therefore much used for preserving specimens in natural history.

The Borneo C. or Sumatra C. of commerce, sometimes called hard C., is the produce of *dryobalanops aromatica*, a large tree of the natural order *dipteraceæ* (q.v.). The C. is obtained by cutting down the tree, and splitting it into small pieces; being found in crystalline masses in natural cavities of the wood. To this substance, the Chinese ascribe extraordinary medicinal virtues, so that it is sold among them at more than 50 times the price of common camphor. It is seldom brought to Europe as an article of commerce.—The *dryobalanops aromatica* yields also a pale-yellowish limpid fluid, which gushes out when deep incisions are made in the tree with an axe, and which is generally called liquid C. or C. oil. It is sometimes imported into Europe. It has a smell somewhat resembling that of C., but more aromatic, like oil of cajeput. It is supposed to be from this fluid that the crystalline hard C. is deposited. See Borneene.

CAMP'HUYSEN, Dirk Rafaelsz, 1586–1627; a Dutch painter, theologian, and poet. He made a translation of the Psalms, and wrote many short poems of merit; also several theological works, among which was a compendium of the doctrines of Socinius. His fame rests upon his work as a painter, which was more than ordinarily good.

CAMPI, a family of artists, who founded at Cremona, in the middle and near the close of the 16th c., an eclectic school of painting, parallel with that founded by the family Caracci (q.v.). Giulio C. (1500–72) was the head of the school. He studied painting, sculpture, and architecture under Giulio Romano. He also imitated the works of Titian (at least in coloring) and Pordenone with such success that his pictures have sometimes been ascribed to both of these artists. His female heads, like those of his brothers, are remarkably beautiful.—Antonio C. studied, under his brother, both painting and architecture. His knowledge of the latter was very serviceable in several of his paintings; for example, that of the sacristy of St. Peter. He was also a plastic artist, an engraver, and the historian of his native place.—Vincenzo C. (b. before 1532, d. 1591) seems to have followed the guidance of Antonio rather than that of Giulio, and excelled more in small figures than in large pictures. His paintings of fruits are highly valued.—Bernardino C. (b. 1522, d. about 1590), a kinsman of the three brothers C., was the most famous of the whole. Lanzi terms him "the Annibale Caracci" of the school. He studied first under Giulio C., but soon excelled his master. Afterwards, he chose Giulio Romano, Titian, and Correggio as models, but chiefly followed Raphael, yet without servile imitation. Many of his works are found in Milan and Cremona. In the latter place, the cupola of the choir in the church San-Gismondo is Bernardino's master-piece. He was distinguished as a portrait-painter and engraver. The lady-painter, Sophonisba Anguissola, was a distinguished pupil of Bernardino.

CAM'PIAN, or CAMPION, Edmund, 1540–81; one of the few English Jesuits of celebrity; educated at Oxford; ordained deacon in 1567, but as he could not consent to the Protestant formulary as required by the English church, he went to Ireland and wrote a history of that country; and then to Douay, where he joined the society of Jesus. In 1580, he returned to England as a propagandist missionary. The next year he was charged with exciting the people to rebellion and holding treasonable correspondence with foreign powers, found guilty, and hanged at Tyburn, with several others of his order.

CAMPIDO'GLIO, Palaz'zo del, a famous palace erected by Michael Angelo on the Capitoline hill, in Rome. It stands on the site of the ancient capital.

CAMPI'NAS, or San Carlos, a t. of Brazil, in the province, and 70 m. n. of the city of Sao Paulo, is situated in a fertile and picturesque district, on a small river, the Piraticaba, a feeder of the Parana. There are large coffee and sugar plantations in the surrounding district, and large quantities of sugar are exported. Many of the houses are built of mud or clay, and the immense church, whose walls are 5 ft. thick, is composed of beaten earth. Pop. 6,000.

CAM'PION. See Lychnis and Silene.

CAMPOBAS'SO, a province in s. Italy, 1178 sq.m.; pop. '70, 364,208. The surface is almost wholly mountainous, the highest point being monte Miletto, 6,740 feet. Chief products, grain, wine, and vegetables. There are manufactories of steel and iron ware. The most important stream is the Biferno.

CAMPOBAS'SO, a fortified t. of s. Italy, in the province of the same name, about 53 m. n.n.e. of the city of Naples. The town stands on a slope of the monte Verde, in a cool, airy, and healthy region. It has a fine cathedral, a ruined castle, some convents, and palaces belonging to resident nobles. It has manufactures of cutlery, which enjoys a considerable reputation for excellence. Its situation, though far from

inviting as regards scenery, is favorable for trade, which is facilitated by good roads. Pop. 13,500.

CAMPOBAS'SO, NICOLO, Count of, a soldier of fortune in the 15th c.; the son of a noble family whose estates were confiscated because he sided with Anjou in a war against Naples. He sold his services to Charles the bold, but subsequently betrayed him, and was suspected of being concerned in Charles's death. Walter Scott depicted C. in *Anne of Geierstein.*

CAMPOBELLO, an island in Passamaquoddy bay, 2 m. from Eastport, Maine, belonging to New Brunswick; 8 m. long; pop. 1073. There are copper and lead ores; but fishing is almost the only occupation. Recently it has become a summer resort.

CAMPOBELLO, an island of New Brunswick, situated at the mouth of the Passamaquoddy bay, in lat. 44° 57′ n., and long. 66° 55′ west. It is small, being 9 m. long, and from 1 to 3 m. broad; but it is decidedly valuable, possessing some good harbors, and, at its n. end, a light-house of 60 ft. in height. Pop. 1073.

CAMPO DE CRIPTANA, a t. of Spain, in the province of, and about 50 m. n.e. of the city of Ciudad-Real. It has manufactures of coarse cloths, and some trade in corn and fruits. Pop. 5250.

CAMPO-FORMIO, a village in the province of Udine, northern Italy, about 7 m. s.w. of the city of Udine, is celebrated for the treaty of peace here concluded, Oct. 17, 1797, between Austria and the French republic. After subjugating Italy (1796), the French army had crossed the Noric Alps, and threatened Vienna. Austria, therefore, hastened to arrange preliminaries of peace. In the treaty which was concluded by Bonaparte with the count of Coblenz, 17th Oct., 1797, Austria ceded the Netherlands, Milan, and Mantua, and received as compensation the districts Istria, Dalmatia, and the left bank of the Adige in the Venetian states, and the capital, Venice; while France took the remaining territory of Venice, its possessions in Albania, and the Ionian islands. In the secret articles of the treaty, Austria, in ceding the left bank of the Rhine, was to receive as cosmpenation Salzburg and the Bavarian district on the Inn; and promises were held out to the duke of Modena, and other Italian houses, that their concessions should be compensated at the cost of Germany.

CAMPOMA'NÉS, PEDRO RODRIGUEZ, Count of, Spanish minister and director of the royal academy of history at Madrid, founded by Philip V. in 1738, was b. in Asturias in 1723. His talents and learning were devoted to the advancement of his native country. By his enlightened views of state policy, as well as by his writings, which ranked him among the most eminent Spanish authors, he obtained a great reputation through out Europe. He gave effectual assistance to count Aranda in his difficult enterprise of driving the Jesuits out of Spain. He died Feb. 3, 1802. C.'s chief works are *Antiguedad Maritima de la Republica de Cartago con el Périplo de su general Hannon, traducido del Griego y ilustrado* (Madrid, 1756); *Discurso sobre el fomento de la Industria popular* (1771); *Discurso sobre la Educacion popular de los Artisanos y su fomento* (1775); *Apéndice a la Educacion popular* (1775–77). These writings contained his opinions on politics, taxation, agriculture, manufactures, and commerce. The best known of his financial productions is *Tratado de la Regalia de Amortizacion* (Madrid, 1765).

CAMPO SANTO (holy field) is now the Italian designation for a cemetery or burying-ground, but more especially for an inclosed place of interment, surrounded internally by an arcade, and destined to receive the remains of persons of distinction. The most famous C. S., and that from which the others derived the name, is that of Pisa—in the neighborhood of the Dome, and consecrated to the memory of men who had deserved well of the republic. It was founded by archbishop Ubaldo, towards the end of the 12th century. The archbishop, having been driven out of Palestine by Saladin, brought his fifty-three vessels, which had been destined for the conquest, laden with the earth of the Holy Land. This he deposited on the spot which was thence called the holy field, and which, as we have said, gave its name as a generic term to the burying-grounds of Italy. The architect of the existing building was Giovanni Pisano, under whose superintendence it was completed in 1283. It contains an area of 400 ft. in length, and 118 in breadth; and is surrounded by a lofty wall, on the inner side of which a wide arcade runs round the whole inclosure, giving to it the character of one magnificent cloister. At the smaller eastern side, there is a large chapel, and two smaller chapels of smaller size on the northern side. The lofty circular arches of the arcade are filled with the richest Gothic tracery, which belongs, however, to a later date—the latter half of the 15th c.—and consequently formed no part of the original design. The walls are adorned with frescoes which are of great interest and value, both absolutely and with reference to the history of art. The oldest of those which have been preserved adorn one side of the eastern wall: they represent the passion of Christ, his resurrection, and other sacred subjects. These remarkable paintings are supposed to date before the middle of the 14th c., and are ascribed to Buffalmaco. But the most marvelous productions are those of Giotto (q.v.), of Simone Memmi, the friend of Petrarch, and of Andrea and Bernardo Orcagna. As a museum of classical antiquities, the C. S. is perhaps even more remarkable than in any other point of view. Altars, sarcophagi, bass-reliefs, statues,

inscriptions, everything that is interesting or curious which has come into the possession of the Pisans for centuries, they have accumulated within its walls.

CAMPUS, in ancient Rome, a vacant space in or near a city, for public shows, combats, etc. There were eight around Rome, of which the C. Martius (camp of Mars) was the most important. It was outside the walls, occupying the level space between the Quirinal, Pincian, and Capitoline hills. In this met the *comitia centuriata* and the *comitia tributa;* and in it was the public hall for the use of the magistrates and foreign ambassadors, who were not permitted to enter the city. In later times it became a pleasure ground, with shaded walks, gardens, baths, theaters, and a race-course. Julius Cæsar built within it the marble halls for the comitia; Agrippa the baths and the pantheon; Augustus his own mausoleum; and Statilius Taurus the first stone amphitheater. Later emperors crowded this particular C. with public buildings and private residences. Under Aurelian it was taken in as a part of the city. The district in which the old C. was situated is now called Campo Marzo. Another ancient C. was the Sceleratus, the polluted field, where vestals who had been untrue to their vows of chastity were buried alive. The open grounds around modern colleges often bear the name of campus.

CAMPVERE, now called VERE, VEERE, or TER-VERE, a small fortified t. on the n.e. of the island of Walcheren, in the Netherlands province of Zealand, 4 m. n.n.e. of Middelburg. It has a port on the Veersche Gat, which runs from the Sloe to the Roompot, separating Walcheren from North Beveland. The town has fallen into decay; but its former prosperity is indicated by the town-house of white freestone, with elegant tower, and the front ornamented by statues of several lords and ladies of the house of Borssele; and by the large and beautiful cathedral church which is no longer used. Pop. Jan. 1, 1875, 1192. C. owed its name to the ferry (Dutch, *veer*) existing from thence to the village of Campen, in North Beveland, the site of the present hamlet of Kamperland.

From a historical point of view, C. is a town of great interest. In 1304, it was the scene of a battle between William, governor of Holland and Zealand, and Guy, count of Flanders, who was victorious. In 1572, the Spaniards were driven away; and a century later, C. was the first town which proclaimed William III., the prince of Orange, general stadtholder. It is chiefly interesting as the seat of a Scottish factory for three and a half centuries. Wolfaard van Borssele, lord of C., having, in 1444, married a princess of the Stuart line, an impulse was given to the Scottish trade. A factory of merchants was formed, and by contract between the royal burghs of Scotland and the united provinces, C. became the only staple port. The goods could not be transferred to any other place until sold, merchants resorting thither to do business. The factors obtained many privileges, such as freedom from several duties and the right of being governed by the law of Scotland, having a lord conservator who was supreme judge in all matters. No factor might settle at C. without the written authority of the commissioners of royal burghs of Scotland, who took security for his honorable behavior. In 1795, the Batavian republic withdrew the privileges, and the factory was broken up but the conservatorship was held as a sinecure long after the necessity for the office had ceased, the name of sir Alexander Ferrier appearing in the *Edinburgh Almanac* as "conservator at Campvere" so lately as 1847. The magistrates of C. were bound to provide a church for the factory, "to the end that the people of the Scottish nation be not frustrate of the Word of God and exercise of the reformed religion in their own proper language." The ministers were appointed by the commissioners of royal burghs, from 1613 to 1790, when the last appointment was made.

CAMTOOS, or GAMTOOS, a river of the e. division of the Cape Colony, of 200 m. in length. It rises in the Niewveld mountains, near lat. 32° s., and, flowing through the inland district of Beaufort, and the maritime one of Uitenhage, falls into that inlet of the sea which is immediately to the w. of Algoa bay. It is valuable as an aid to irrigation. For instance, Hankey, a station of the London missionary society on its banks, is thoroughly watered by means of a splendid tunnel carried through solid rock at the expense of the association just mentioned.

CAMUCCI'NI, VINCENZO, one of the most distinguished modern historical painters in Italy, was b. in Rome, 1775. The school of which he became the head was founded on the theatrical antique style of the French painter David. The first important works by C. were the "Assassination of Cæsar" and the "Death of Virginia;" both painted for lord Bristol at the commencement of the present century. His picture of "Unbelieving Thomas" was copied in mosaic for St. Peter's church. For the church of San Giovanni in Piacenza he executed a "Presentation in the Temple," which was greatly admired. These works were followed by many scenes from Roman history; among them, the pictures of "Horatius Cocles," and "Romulus and Remus" as children. C., who, as a man and an artist, was highly honored during his career, died at Rome, Sept. 2, 1844.

CAMUS, ARMAND GASTON, a prominent character in the French revolution, was b. in Paris, April 2, 1740. On account of his superior knowledge of ecclesiastical law, he was elected advocate-general of the French clergy. He was a zealous and ascetic Jansenist, and possessed of extraordinary firmness of character. He hailed the movements of 1789 with joy, and was elected member of the states-general by the people of Paris.

In this position, he appeared as the resolute foe of the ancient régime. He gained possession of, and published, the so-called *Red Book*, giving accounts of court expenditure, which was highly disadvantageous to the court and its ministers. After the fight of Louis XVI., C., with Montmorin, Lafayette, and Bailly, accused the king of treason and conspiracy, and insisted on the suppression of all orders and corporations based on hereditary rights. As conservator of the national archives, he rendered an important service by preserving from destruction the old documents of the abolished corporations and institutions. He was absent in Belgium during the king's trial, but sent his vote for death. In Mar., 1793, when he was commissioned to make prisoners of Dumouriez and other generals suspected of treason, C. himself and his four colleagues were taken prisoners and delivered over to the Austrians (April 3); but, after an imprisonment of two and a half years, he was exchanged for the daughter of Louis XVI. On his return to Paris, he was made member of the council of five hundred, of which he became president, Jan. 23, 1796, but resigned 20th May, 1797, and devoted his time to literature. Remaining, however, true to his principles, he voted, July 10, 1802, against Napoleon's proposed consulship during life. C. died of apoplexy, Nov. 2, 1804.

CAMUS, Charles Etienne Louis, 1699–1768; a French mathematician, associate of the Paris academy of sciences, and member of the royal society of London. In 1736, he accompanied Maupertuis and Clairaut in an expedition to Lapland to measure a degree of the meridian. He was the author of a *Course of Mathematics*, and several essays on mechanical and mathematical subjects.

CAMWOOD, or Barwood, a dyewood which yields a brilliant but not permanent red color, and is used along with sulphate of iron to produce the red color in English bandana handkerchiefs. It is the wood of *baphia nitidia*, a tree of the natural order *leguminosæ*, sub-order *cæsalpiniceæ*, a native of Angola. It is preferred to Brazil wood (q.v.), as producing a finer and richer red.

CA'NAAN, the fourth son of Ham, and grandson of Noah. The posterity of Canaan were numerous, there being ten sons who were the fathers of as many tribes dwelling in Palestine and Syria. His eldest son, Zidon, is supposed to have been the founder of the city of Sidon. The whole of Palestine was called after the patriarch the "Land of Canaan." As to the curse pronounced by Noah upon Canaan and his descendants, there is no just reason to suppose that it was the immediate consequence of the unfilial conduct of Ham.

CA'NAAN. See Palestine.

CA'NAANITES, a collective name for the several nations conquered by the Israelites on the w. side of Jordan. Five, six, seven, and ten nations are mentioned in various places in the Old Testament; but of only two of them have we any collateral information—the Hittites, and the Amorites. And the former of these appears to have been included not with strict propriety among the Canaanites, evidence now tending to show that they not only dwelt beyond the border of Canaan, but did not even speak a Semitic language; nor were they homogeneous with other Canaanitish people. In general, the Canaanites are described as living in a state of political disintegration; the combined result of Semitic love of independence, and of varied conformation of the soil. Thirty-one of their petty kings are mentioned in the book of Joshua. That the Israelites were not immediately successful in conquering the C. is now universally recognized. The work of many years was concentrated by tradition on a single great name. The immediate result of the Israelite invasion was, not the extinction of the old, but the addition of a new element of stronger material, but less advanced culture. The chief object of Canaanitish worship was the dual-natured god of life and fruitfulness, Baal, or the Baal, "the lord," and his consort Ashérah, "the happy." The masculine form of the latter was the name of one of the twelve sons of Jacob. Ashérah must not be confounded with Ashtoreth or Astarte, who belonged to another type of Semitic religion. The symbol of Ashérah was the stem of a tree, though possibly sometimes carved into an image; that of the Baal probably had the form of a cone and represented the rays of the sun, or the generative power. It is these symbols which are referred to in the phrase "the Baals and Ashérahs" (Judges iii. 7), where "the groves" of the king James's version is clearly a mistranslation. The licensed harlotry which formed a part of the worship of Ashérah was peculiarly obnoxious to the later Hebrew prophets, though, indeed, even the folk-lore of the Israelites shows traces of aversion to its attendant immorality. Another characteristic of the Canaanitish religion was soothsaying, and this was vigorously denounced by the conquerors (Deut. xviii. 10–14). There were relics of Canaanitish times in old traditions which the Israelites did not suppress, and it is alleged by uncompromising historical critics that some of the narratives in Genesis are revised and purified versions of Canaanitish legends. The most obvious of these are said to be the stories which are attached to localities in Canaan, such as Luz and Beersheba. The question whether a remnant of the old population of Palestine may not be still in existence is answered in the affirmative by several recent investigators, who find descendants of the C. in the fellahs or peasants of the Holy Land. From an ethnological point of view there seems to have been a close affinity of the three peoples, the Israelites, the C., and the Phœnicians, who appear to have

migrated successively from a Babylonian center, and the last to move westward were probably the Hebrews.

CANADIAN RIVER, rising in n.w. Mexico, 25 m. n.e. of Santa Fé, running s. 150 m., and then e. near the bounds of the Indian territory and Texas, thence through the Indian territory, and emptying into the Arkansas river near the w. boundary of the state of Arkansas; whole length about 600 miles.

***CANADA**, as a geographical designation, has had in history a variety of meanings. Originally, it comprised an extensive range of country reaching, under the French, as far as even the Mississippi, away beyond the boundary lakes. It was subsequently limited to a region chiefly in the basin of the St. Lawrence—including in that term both the lakes and the river. C., in the sense in which that word is most generally known, was, in 1791, divided into two provinces, Ontario and Quebec, or Upper and Lower Canada.* These two sections were reunited in 1840; but became separate members of the confederation—the Dominion of Canada—in 1867. The country composed of these two provinces extends eastwards from a line drawn between lake Superior and James bay, a branch of Hudson's bay, to the gulf of St. Lawrence. Northward, it reaches from the Canadian lakes and the St. Lawrence to the high ridge of land which separates the rivers of C. from those of the region long known as the Hudson bay territory, but since 1870 forming a part of the Dominion of Canada. C. is bounded n. by the (former) Hudson bay territory; e., by the gulf of St. Lawrence; s., by the states of Maine, New Hampshire, Vermont, New York, and the lakes Erie and Ontario; w., by lakes St. Clair, Huron, and Superior; and n.w., by the Indian territories. The area of C. is about 331,280 sq.m., of which 121,260 are in the province of Ontario, and 210,020 in the province of Quebec. The principal river of C. is the St. Lawrence, and its most important tributaries are all from the left. The St. Lawrence drains an area of 565,000 miles. The Ottawa, 450 m. long, forms the boundary between Ontario and Quebec. The St. Maurice, nearly 400 m. in length, and the Saguenay, noted for its fine scenery, rank as rivers of the first magnitude, according to European analogies. The only affluents from the right worth naming are the Richelieu, the St. Francis, and the Chaudiere; and even of these subordinate streams, the last two are totally Canadian, while the first, as the outlet of lakes Champlain and George, belongs to the United States only in part.

In 1535, Jacques Cartier, a French navigator, b. at St. Malo in 1494, entering the St. Lawrence on the festival of the saint of that title, took nominal possession of North America in the name of his king, Francis I. It was not, however, till nearly a century later (1608) that Quebec was taken formal possession of. From that stronghold, France ruled for 150 years a vast region, extending eastward to Acadia—Nova Scotia—westward to lake Superior, and down the Mississippi to Florida and Louisiana. In 1759, a small British army—5000 in number—under the command of gen. Wolfe (q.v.), virtually wrenched *La Nouvelle France*, on the "plains of Abraham," from her first European rulers by the taking of Quebec. Isle aux Noix, and forts Oswegatchie and Lévis, successively passed into the hands of the British, and then Montreal was beleaguered and taken by gen. Amherst with an army of 17,000 men. The capitulation of that city, which was signed Sept., 1760, brought to a final close the era of French dominion in Canada. The people of the conquered country were secured, by the terms agreed to, in the free exercise of their religion; and peace was concluded between Britain and France in 1763.

In that year, a small portion of the recently acquired territory was organized by royal proclamation under English laws. In 1774, the new province was extended by parliamentary enactment, and that under French laws, down the Ohio to its confluence with the Mississippi, and up the latter stream to its source. Finally, C. receded to its present limits in 1783, giving up to the American republic the sites of six sovereign states—Minnesota, Wisconsin, Michigan, Ohio, Indiana, and Illinois. In 1791, it was divided, under separate legislatures, into two sections—the eastern retaining French institutions, and the western receiving those of England; and these sections, again, after political discontent had in each ripened into armed insurrection, were re-united for legislative purposes in 1840.

In 1763, the French population amounted to about 65,000, occupying the immediate banks of the lower St. Lawrence and its tributaries. Excepting within the cities of Montreal and Quebec, the immigrants of a different origin, whether from the old colonies or from the mother country, scarcely attempted to establish themselves among the ancient settlers; thus producing a kind of reciprocal isolation, which, even down to the present day, has not been materially disturbed. Generally speaking, therefore, the two grand elements of the provincial population are locally distinguished from each other—a relative position which has happily excluded, as between them, nearly every difficulty as to education and religion. The settlers of French origin, almost entirely confined to lower C., occupy the banks of St. Lawrence and of the lower courses of its tributary streams; all the rest of lower C. and the whole of upper C., so far as they are reclaimed at all, belong to colonists of English race.

The origin of the name is most probably to be found in the assertion that Jacques

* In the first half of the article the name Canada is used in this sense; the second half gives a notice of the *Dominion* as now constituted.

DOMINION OF CANADA

British Miles
20 0 40 80 120

RUPERTS LAND

LAKE SUPERIOR

ONTARIO

QUEBEC

NEW BRUNSWICK

NOVA SCOTIA

PRINCE EDWARD IS'D

CAPE BRETON ISLAND

NEWFOUNDLAND

ANTICOSTI

MAGDALEN ISLANDS

GULF OF ST. LAWRENCE

ATLANTIC OCEAN

BAY OF FUNDY

LAKE HURON

LAKE ERIE

LAKE ONTARIO

NEW YORK

VERMONT

NEW HAMPSHIRE

MAINE

MASSACHUSETTS

RHODE ISLAND

CONNECTICUT

NEW JERSEY

PENNSYLVANIA

OHIO

MICHIGAN

MARYLAND

DELAWARE

OTTAWA

TORONTO

MONTREAL

QUEBEC

FREDERICTON

CHARLOTTETOWN

HALIFAX

ST. JOHN'S

ALBANY

BOSTON

HARTFORD

PROVIDENCE

CONCORD

MONTPELIER

AUGUSTA

NEW YORK

TRENTON

PHILADELPHIA

Reference to Smaller Counties in Ontario or Upper Canada

1 Essex	10 Brant	19 Northumberland
2 Bothwell	11 Haldimand	20 Pr. Edward
3 Lambton	12 Welland	21 Lennox
4 Middlesex	13 Monck	22 Frontenac
5 Elgin	14 Wentworth	23 Grenville
6 Norfolk	15 Halton	24 Dundas
7 Oxford	16 Peel	25 Russell
8 Perth	17 Cardwell	26 Stormont
9 Waterloo	18 Durham	27 Prescot
		28 Gleugary

Reference to Smaller Counties in Quebec or Lower Canada

1 Argenteuil	14 Richelieu	29 Sherbrooke
2 Two Mountains	15 S. Hyacinthe	30 Stanstead
3 Terrebonne	16 Rouville	31 Compton
4 L'Assomption	17 Iberville	32 Beauce
5 Vandreuil	18 St. John	33 Megantic
6 Soulange	19 Missisquoi	34 Lotbiuiere
7 Huntingdou	20 Brome	35 Levi
8 Beauharnois	21 Shefford	36 Dorchester
9 Chateauguay	22 Bagot	37 Bellechasse
10 Napierville	23 Drummond	38 Montmaguy
11 La Prairie	24 Yamaska	
12 Chambly	25 Nicolet	
13 Vercheres	26 Arthabasca	
	27 Wolfe	
	28 Richmond.	

Longitude West of Greenwich

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Cartier, the discoverer of Canada, having heard the natives apply the Indian word *Kannatha* (village) to their settlements, mistook it for the name of the whole country.

Upper and lower C. have presented a striking contrast in their rates of progress. To take, for instance, the growth of towns: In lower C. there are only two towns with a pop. (1871) above 5,000—Lévis, on the St. Lawrence, 6,691, and Sorel, at the confluence of the St. Lawrence and the Richelieu, 5,636—in addition to Quebec, Three Rivers, and Montreal, the three French foundations. The growth of Montreal and Quebec, remarkable enough in itself, has been owing rather to their commercial facilities with regard to the country at large than to the agricultural resources of their immediate vicinities; while Toronto, London, Kingston, and Hamilton—each nurtured chiefly by its own locality—have an aggregate population of above 110,000. Great part of upper and lower C., more especially the shores of lake Superior, is valuable only for mineral resources, such as iron, zinc, lead, copper, silver, gold, cobalt, manganese, gypsum, marl, granite, sandstone, limestone, slate, and marbles of nearly every imaginable color. Considerable portions also, though heavily timbered, chiefly with pine, are yet but little adapted to settlement and cultivation. Towards the gulf of St. Lawrence, again, a considerable section derives importance mainly from the fisheries, being, with partial exceptions in Gaspe, comparatively worthless for every other object. Thus the area for the profitable production of ordinary cereals cannot materially exceed 40,000 sq.m., containing, however, within this space a singularly small proportion of irreclaimable surface. This cultivable block increases in width and fertility from its commencement on the lower St. Lawrence to the shores of lake Huron. Below Quebec—to say nothing of the precarious nature of the crops—there may always be seen, on one or on both sides, the primeval forest. Between that city, again, and the basin of the Ottawa, a gradual improvement shows itself, even on the n. side; and towards the s., there stretches away to the frontier of the United States a broad belt of generally undulating character, probably the best field in the country for the blending of pasturage and agriculture. From the basin of the Ottawa inclusive, the parallel of the s. end of lake Nipissing may be said to cut off, towards the s.w., the entire residue of the practicable soil, in the shape of a roughly defined triangle, which, as a whole, is at least equal, in the growth of grain in general and of wheat in particular, to any region of the same extent in North America.

As C. slants southwards eight or nine degrees from the mouth of the St. Lawrence to that of the Detroit, which communicates between lakes St. Clair and Erie, the climate of the w. must be warmer than that of the east. In addition to this cause of difference, it holds as a general law over the continent that the climate improves in advancing westward, even on the same parallel. Besides, the lakes of upper C. appear, in a good measure, to neutralize and mitigate the extremes of a Canadian climate. While Quebec in winter ordinarily enjoys five or six months of sleighing, the corresponding season in Toronto ranges from five or six days to five or six weeks. As to summer, the difference in favor of Toronto is rather in point of duration than of intensity. As indications of the climate of C., it may be stated that the isle of Orleans, immediately below Quebec, is famous for its plums, and the island of Montreal for its apples; and from the neighborhood of Toronto to the head of lake Erie, grapes and peaches ripen without any aid whatever. Melons, again, of large size, come to maturity, through the settled parts of the province, in the open air; and pumpkins and squashes attain enormous size, some of them near Toronto having weighed 300 lbs. The climate of C., though, as a whole, vastly steadier than that of the British isles, is yet occasionally liable to such changes as among us are all but impossible. Montreal, for instance, may be said, on an average, to have an extreme cold of 24° below zero, and an extreme heat of 96° above it. Now, on short notice, a thaw may surprise the former temperature, and a frost the latter; so that there is room, in winter and summer respectively, for a comparatively sudden rise or fall of about 60°. In fact, it may be said that C. has the summer of Italy and the winter of Southern Russia or North Germany. The average summer temperature of Toronto is 67.8°, of Paris, 64.5°, and of Rome, 74.2°; while the average winter temperature of Toronto is 24.5°, of Berlin, 31.4°, and of St. Petersburg, 18.1°. And, lying in the latitudes of the summer rains, and of the most valuable cereals and grasses, the latitude most favorable for animals which enhance domestic wealth—the ox, the sheep, and the horse—C. occupies one of the best positions in the world for rearing men and women. It lies in the latitude where man attains the greatest energy of body and mind, and from which have hitherto issued the conquering races. C. may thus be looked on as destined to influence the future of the world.

The Dominion of Canada.—The name Canada has lately acquired an enormous extension of territorial signification. In 1867, an act for the union of C. (Upper and Lower), Nova Scotia, and New Brunswick was passed, and by it these provinces were federally united into one Dominion of C. under the crown of the United Kingdom, with a constitution similar to that of the mother country and with Ottawa for its capital. All the vast territory which the Hudson bay company held under a charter issued by Charles II., was transferred to the imperial government in Dec., 1869—the company receiving an indemnity from the Canadian government of £300,000—and was, by order of H. M. the queen in council, received into the Dominion the following year. The portion of that territory known as Red River Settlement (q.v.) was in 1870 erected into the province of Manitoba. (The district to the n. and e. of Manitoba is now known as

Keewatin. The vast region towards the n.w. was organized as a territory in 1875 under the name of the North-west territory.) British Columbia became a member of the Dominion in 1871. Prince Edward island joined the confederation in 1873, and the accession of Newfoundland cannot be long deferred.

This vast extent of territory, extending from the latitude of Rome to the Arctic ocean, stands in superficial area (3,500,000 sq.m.), even if we exclude Labrador and the islands of the Arctic ocean, little behind the United States (3,603,000) and Europe (3,720,000). East and w. it extends from the 53d to the 141st meridians. The total habitable area is, however, diminished considerably when the frozen regions n. of the 60th parallel of latitude are deducted.

The physical characteristics and statistics of the various provinces will be found discussed under their several heads.

The census of 1871 gives the following figures for the several provinces:

Provinces.	Area in sq. miles.	Pop. 1871.
Ontario	107,780	1,620,851
Quebec	193,355	1,191,516
New Brunswick	27,322	285,594
Nova Scotia	21,731	387,800
Manitoba	13,969	12,228
British Columbia	356,000	33,586
Prince Edward island	2,133	94,021
North-west territory	2,650,000	60,500
Total for Dominion	3,372,290	3,686,096
Newfoundland (1869)	40,200	146,536
Total for Dominion of the future	3,412,490	3,832,632

The Indian population of the Dominion was in 1877 reported by the superintendent of Indian affairs to amount to 99,650. In 1871, the number of immigrants into the Dominion was 37,949; in 1873, they numbered no less than 99,059; and in 1874, 80,022. Of these a fair proportion became actual settlers; thus of a total of 31,650 immigrants in 1876, 25,633 settled in the country. Of late there has been some immigration from the United States. In 1879, there were upwards of 6000 Chinese residents in British Columbia.

Church and Education.—There is no state church in C. In 1871, there were 1,492,000 Roman Catholics in the Dominion, the mass of the inhabitants of Quebec province being French Catholics. The Presbyterians numbered 544,000; the Methodists, 514,000; and the Episcopal church, 494,000. Lutherans, Congregationalists, and many other sects are also represented. The Episcopal church is governed by nine bishops, and the Roman Catholic church by four archbishops and fourteen bishops.

Education is carefully fostered in the Dominion. Especially in the oldest settlement both primary and secondary schools are numerous. The province of Ontario had in 1871 nearly 5000 educational establishments, including 16 called colleges. Quebec has 3 universities, 1 being Catholic, and above 20 classical and industrial colleges. New Brunswick has nearly 1000 primary schools. Nova Scotia has a university at Halifax; and the new province of Manitoba has already a university at Winnipeg. In 1871, there were 420 newspapers and other periodicals published in C., of which 255 appeared in Ontario.

Revenue.—The total revenue of the Dominion of C. for the financial year ending June, 1877, amounted to £8,877,956, and the gross expenditure was £8,840,324, leaving a surplus of £37,632. In the financial estimates for the year ending June, 1879, the total expenditure was fixed at £7,866,876. The debt of the Dominion, incurred chiefly on account of public works, the interest of which forms the largest part of the expenditure, amounted in 1878 to £29,879,421; and of this capital, £24,497,524 represented debt payable in London.

Commerce.—The trade of the Dominion is chiefly with the United States and Great Britain; and while the greater part of the Canadian exports finds its way to Great Britain, the imports are now chiefly from the United States. Thus, of a total exportation of 76,000,000 in 1877, 41 millions went to Great Britain, 26 millions to the United States; while of a total importation of 99,000,000, 40 millions came from Great Britain, but 51 millions from the United States. In 1878, the total exports were valued at $79,323,667 (£15,864,000); the imports at $93,081,787 (£18,616,000). The staple articles of export are wood and breadstuffs; also fish, furs, etc., and minerals. The chief imports from the United Kingdom are iron, wrought and unwrought, woolen manufactures, and cotton goods.

Shipping.—The merchant shipping of C. is important, and, considering its population, remarkably extensive. At the end of 1877, there were 7362 vessels on the regular books of the Dominion, measuring 1,310,468 tons of register tonnage. C. is, accordingly, the fifth in rank of the ship-owning states of the world, following, for extent of shipping, Britain, the United States, Norway, and Italy, but taking precedence of Germany, France, and all other maritime powers.

Fisheries.—The total produce of the Canadian fisheries in 1877 was valued at £2,405,991. In that year fish to the value of £1,400,140 were exported. This includes the fisheries of British Columbia, but of course excludes those of Newfoundland. In 1879, there were seven establishments in C. for artificial fish culture, from which in the preceding year 13,500,000 young fish (salmon, speckled trout, and white fish) were sent forth into the waters of the Dominion.

Mines.—In the year 1876–77, Canadian mines gave produce (including, coal, gold, gypsum, manganese, mineral oil, copper, iron, lead, silver, salt, slate, and stone) to the value of £739,790.

Canals and Railways.—In the matter of communication C. is unrivaled. The St. Lawrence, with its lakes, puts great part of it in connection at once with the most commercial section of the United States and with the open ocean. The navigation of this great water system has been greatly assisted by art; numerous and extensive canals, of which the Rideau and the Welland are the most important supplement to the main artery. The revenue of the canals in 1877 amounted to £74,790. C. is also not deficient in roads of every description, at least in the settled regions; and it already possesses an immense and steadily increasing network of railways. In 1877, there were in operation over 5,570 m. of railway, while nearly 2,000 m. were in course of construction. The Grand Trunk railway, 1388 m. in length, and giving unbroken communication between Portland and Detroit, is the longest line in the world owned by one company and under the same management. The Victoria bridge, by which the railway crosses the St. Lawrence at Montreal, is one of the wonders of the world. In 1872, the imperial parliament notified the guarantee of a Canadian loan, to be applied to the construction of a railway through British territory to the Pacific shores; but the original arrangements have been departed from, and the undertaking progresses but slowly. There has been much debate as to the best point for the terminus. The total revenue of the railways in the year 1876–77, was £3,748,413. There is weekly communication betwen Liverpool and Glasgow and Montreal and Quebec.

Army and Naval Force.—The number of imperial troops in C. was in 1871 reduced to 2,000 men, who form the garrison of the fortress of Halifax—still accounted an "imperial station," as it also is the headquarters of the British fleet in these waters. C. has besides a large volunteer force, and a recently organized militia, consisting of all male British subjects in C. between the ages of 18 and 60. The active militia consisted in 1879 of 43,729 officers and men, and the reserve comprised 665,000 men. C. is divided into 11 military districts; there is a royal military college at Kingston, and several centers of military instruction. The naval armament of C. consisted in 1877 of 8 armed screw-steamers, of a total tonnage of 2,014 tons, besides two other fast steamers available as gun-boats. These are provided partly by the imperial government, partly by the Dominion, and are kept on the great lakes and on the St. Lawrence.

Money, Weights, and Measures.—The decimal system of currency was introduced in 1871, the unit of account being the dollar (at the average rate of exchange equal to 4*s.*). The English imperial yard, pound avoirdupois, and gallon are standards for C.; but in 1859 the hundredweight of 112 lbs. and the ton of 2,240 lbs. were abolished, a hundredweight of 100 lbs. and a ton of 2,000 lbs. being substituted.

See the articles on the various provinces and the towns of the Dominion; and CANADA.

***CANADA** has recently acquired a more enlarged signification. An act of the imperial parliament (called shortly the *British North America* act) was passed 29th Mar., 1867, and came into force 1st June of the same year, uniting federally the former separate provinces of Canada, Nova Scotia, and New Brunswick into one *Dominion*, under the name of *Canada*. The upper and lower divisions of the former Canada (q.v.), which had been politically united since 1840, are again dissociated, so that the federation consisted, in 1867, of four members or provinces, as under:

	English square miles.
Quebec (formerly *Lower Canada*, or *Canada East*)	210,020
Ontario (formerly *Upper Canada*, or *Canada West*)	121,260
New Brunswick	27,105
Nova Scotia	18,660
Total	377,045
Estimated population (1867)	3,800,000

The constitution of the Dominion is after the model of the mother-country. The parliament consists of the queen, an upper house styled the senate, and a house of commons. The queen is represented by a governor-general (with a salary of £10,000), who exercises his authority with the aid and advice of a council, styled the queen's privy council for Canada, chosen from time to time by the governor. The senate, in 1867, consisted of not more than 72 members, 24 for each of the provinces of Ontario and Quebec, and 12 each for the maritime provinces. The senators are chosen by the governor-

general, and hold the appointment for life. Among other qualifications, a senator must have real property to the value of $4,000, and must be resident in the province for which he is appointed. The speaker of the senate is nominated by the governor-general. The house of commons consisted at the same date of 181 members—82 for Ontario, 65 for Quebec, 19 for Nova Scotia, and 15 for New Brunswick. The duration of a house of commons is five years. Until the parliament of Canada otherwise provides, the franchise and other regulations are to be the same as those hitherto in force in returning members to the house of assembly in the several provinces. The house of commons elects its own speaker. Any bill passed by the houses of parliament, even though assented to by the governor-general in the queen's name, may afterwards be disallowed by the queen in council. Each province has an executive and legislature of its own, presided over by a lieutenant-governor, and constituted in the mean time pretty much as before the union. The lieutenant-governors are appointed by the governor-general. The provincial parliaments may, under the provisions of the act, amend from time to time their own constitutions.

In the distribution of legislative power between the general and the provincial parliaments, certain classes of subjects of a local nature are assigned exclusively to the legislatures of the provinces, while subjects of more general concern are assumed by the parliament of Canada. Among the subjects enumerated in the act as coming under the latter description are: the public debt and property; taxation (for federal purposes), postal service, military and naval defense, the salaries of the civil officers of the general government; the census; navigation; money, weights, and measures; copyrights; marriage and divorce; criminal law. The provincial legislatures, again, have the power of taxing themselves for provincial purposes, and of borrowing money on the sole credit of the province; of regulating and paying provincial officers; of establishing asylums, etc. Education is also left to the provincial legislatures, with certain provisions against encroachment on the rights of religious minorities.

The debts of the several provinces, at the union, are assumed (with certain limitations) by the federal government; and on the other hand, certain duties and revenues, and certain public works and properties belonging to the several provinces before the union, are taken possession of, to form a consolidated revenue fund for defraying the interest of these debts, and for the other expenditure of the federal government.

Provision is made for the introduction of uniformity of laws, which, however, must be with consent of the legislatures of the several provinces.

The union of the various British American provinces had been long and eagerly discussed, public opinion in Canada being generally in its favor, but in the other provinces strongly opposed to it, from the natural apprehension that the immense preponderance of C. in population, wealth, and general importance would utterly swamp the others. However, after much and careful consideration, the great advantages which it was shown the scheme would confer, overcame the provincial jealousies, the pro-federalists in Nova Scotia and New Brunswick came to preponderate, and these two provinces were, in 1867, united with Quebec and Ontario to form the Dominion of Canada. In British Columbia and the Hudson's bay territories the feeling in favor of annexation was strong, and in 1869 the latter, and in 1871 the former, was transferred to the imperial government. The Hudson's bay company received an indemnity of £300,000. In 1871, the Red river settlement was formed into a province under the name Manitoba. In 1873, Prince Edward island was annexed. The only part of British North America which stands aloof is Newfoundland, but provision has been made for its admittance in the act of union, and its accession cannot be long deferred. The area of the vast dominion is about 3,500,000 sq.m., exceeding that of the United States, and little inferior to Europe. The number of members of parliament given above has, of course, been increased by the representatives of the new provinces—viz., 2 senators and 4 members of the house of commons for Manitoba, 3 senators and 6 members for British Columbia, and 4 senators and 6 members for Prince Edward island. The total (with a few additional members in the old provinces) was in 1879, 75 senators, and 205 members of the house of commons. See *Supp.*, page 887.

CANADA BALSAM is a kind of turpentine (q.v.) obtained from the balm of Gilead fir (*abies* or *picea balsamea*), a native of Canada and the northern parts of the United States. See FIR. It exists in the tree in vesicles between the bark and the wood, and is obtained by making incisions, and attaching bottles for it to flow into. It is a transparent liquid, almost colorless, and with an agreeable odor and acrid taste. It pours readily out of a vessel or bottle, and shortly dries up, and becomes solid. When fresh, it is of the consistence of thin honey, but becomes viscid, and at last solid by age. It consists mainly of a resin dissolved in an essential oil, and its composition is as follows:

Essential oil	18.6
Resin, soluble in alcohol	40.0
Resin, sparingly soluble	33.4
Elastic resin	4.0
Bitter extractive and salts	4.0
	100.0

It is the finest kind of turpentine obtained from any of the *coniferæ*, and is much employed for medicinal purposes, particularly as a stimulant for the eure of mucous discharges, and as a detergent application to ulcers. It is also used for a variety of purposes in the arts—as an ingredient in varnishes, in mounting objeets for the microscope, in photography (q.v.), and by optic ans as a cement, particularly for conneeting the parts of aehromatic lenses to the exclusion of moisture and dust. Its value for optical purposes is very great, and depends not only on its perfect transparency, but on its possessing a refractive power nearly equal to that of glass.

CANADA GOOSE. See Goose.

CANAJOHA'RIE, a t. and village of Montgomery co., N. Y., 50 m. n.w. of Albany; pop. of township '80, 4294. There are fine stone quarries in the vicinity.

CANAL, an artificial ehannel for water, formed for purposes of drainage, irrigation, or navigation, but now usually employed to designate only such cuts as are intended for the passage of vessels.*

Canals date from a period long anterior to the Christian era, and were employed as a means of irrigation and communication by Assyrians, Egyptians, and Hindus; also by the Chinese, whose works of this kind are said to be unrivaled in extent; one of them, the Imperial C., having a length of about 1000 miles. For the most part, however, these early canals were of one uniform level, and henee exhibit no great skill or ingenuity; and the moderns were eontent to follow the rudimentary efforts of the ancients in this way until the 15th c., when the invention of the loek (q.v.)—showing how canals might be generally and advantageously used for inland navigation in countries whose surface was irregular—gave a great impulse to this braneh of engineering. The Italians and Duteh, for both of which nations the invention of the loek has been elaimed, were the first to develop this kind of engineering in Europe. In France, the first C., that of De Briare, to form a eommunication between the Loire and the Seine, was opened in 1642. In 1681 was completed the greatest undertaking of the kind on the continent, the C. of Languedoc, or the C. du Midi, to connect the Atlantic with the Mediterranean. The length of this C. is 148 m., it has more than 100 loeks, and about 50 aqueducts, and in its highest part it is no less than 600 ft. above the sea. It is navigable for vessels of upwards of 100 tons. It was not until nearly a eentury later that C. navigation assumed importance in England, through the sagaeity, energy, and liberality of the duke of Bridgewater (q.v.), and his eelebrated engineer, James Brindley (q.v.). The suceess of these works stimulated other public persons to engage in similar undertakings. Speculation in C. shares beeame a mania similar to that whieh overtook the people in conneetion with railways at a more recent period, and a erash ensued on the prospect of war in 1792. It would be an endless task to pursue the history of eanal development in Britain, whieh speedily beeame interseeted with these watery highways to an extent unequaled in any European eountry save Holland. In the spaee at our disposal, we shall briefly eonsider the several kinds of canal. See Suez and Suez Canal : Inter Oceanic Ship Canal.

Canals may be divided into three general heads—viz., 1. Canals proper, i.e., entirely artificial channels, having no water running through them beyond what is necessary for their own purpose; 2. Tidal, i.e., affeeted by the rise and fall of the tides; and 3. Rivers rendered navigable by weirs built across them to inerease their depth, and having a lock at one end for the aseent or deseent of vessels; and oecasionally, when there is much fall, or any formidable obstruction in the river, by lateral cuts, with loeks for part of their course.

Another division may be made (1) of ship-eanals for the transit of sea-going vessels generally, from sea to sea; these are neeessarily of large dimensions, and must be erossed by swing or draw bridges; and (2) of eanals for the passage of mere boats or barges, generally without masts, so that they may be erossed by stone or other solid bridges. The largest ship C. in Europe is the Great North Holland C., eompleted in 1825, whieh has a breadth of 125 ft. at the water-surface, and of 31 ft. at the bottom, with a depth of 20 feet. It extends from Amsterdam to the Helder, a distance of 51 m.; it thus enables ships of as much as 1400 tons burden to avoid the shoals of the Zuyder Zee. The surfaee of the water in this C. is below the high-water level of the German ocean, from whieh it is proteeted by embankments faced with wicker-work. The locks on this C. are 297 ft. long, 51 ft. broad, and 20 ft. deep. There is a similar C. from near Rotterdam to Helvoetsluis, to avoid the shallows of the Brill at the mouth of the Maas. Another great ship C. is the Caledonian C. (q.v.). The Forth and Clyde C. is also one on a smaller scale for the passage of sea-going vessels. Its length is 35 m.; its medium width is 56 ft. at the surface, and 27 ft. at the bottom, and its depth 9 feet. It has 39 locks, each 75 ft. long, and 20 ft. wide, and a rise of 155 feet. In constructing ship-canals, it

* In the fen-districts of the e. coast of England, however, the large channels required for drainage are made subservient to purposes of inland navigation by sluices at the mouth—one to keep out the tide at high water, and another acting in the opposite direction, to retain water of depth sufficient in the channel to float such boats as make use of it. These combinations of drain and canal are commonly called *navigations;* hence the workmen employed in their construction were called *navigators*, which, contracted into *navvy*, is now applied indiscriminately to persons engaged in any kind of earthworks.

is important to secure a sheltered entrance, one not likely to become silted up, and of sufficient depth to admit vessels at all times of the tide; and towing-paths on both sides are desirable.

Among the principal canals in England for the passage of barges, some of which run to very great elevation, are the—

	Length. Miles.	Rise. Feet.
Grand Junction	128	...
Leeds and Liverpool	128	433
Trent and Mersey	93	326
Kennet and Avon	57	402

The C. of the Loire is one of those aiding the navigation of a river. It has a width on the water line of 33 ft., and a depth of 5¼ ft., the locks being 17 ft. broad, and 100 ft. long. The river Lea and the Mersey and Irwell Navigations in England, and the Welland C. in Canada, formed to connect lake Erie with lake Ontario, and avoid the falls of Niagara, are also among the most noteworthy works of this class; the river Thames, above the first lock at Twickenham, partakes also of the nature of a canal.

Many canals pass through long tunnels, some very low and without towing-paths, in which case the mode of propulsion is by the boatmen lying on their backs and pushing with their feet against the roof of the tunnel.

The great expenditure of water and time in "locking" have led to the trial of various other plans for overcoming differences in level. On the Great Western C., boats are raised and lowered by means of machinery, called a perpendicular lift. On the Morris C. (United States), boats are conveyed on a carriage up a railway inclined plane, from one reach to another; on the Chard C., Somersetshire, and on the Monkland C., near Glasgow, they are taken afloat in a caisson, or water-tight vessel, up or down an inclined plane—in the latter case, empty boats of 60 tons burden are raised or lowered 96 feet.

Other matters engineers have to consider are an ample supply of water, by means of feeders and reservoirs to the summit-level; stop-gates at convenient distances, to shut off the water in case of damage to any part of the C.; means of drainage when repairs are necessary; and provision against leakage through the banks, by puddling or otherwise. The floor-line or bottom of a C. is usually made twice the width of the largest boat likely to enter the C., with an addition of 6 or 8 in. for play at each side, and the depth 12 or 18 in. more than the draught of the boat.

The introduction of railways has materially interfered with C. traffic, and some canals have been altogether abandoned. Many, however, still continue to prosper, as, for instance, the Grand Junction, the Lea Navigation, and the Trent and Mersey. It is estimated that the inland boat navigation constructed in Great Britain exceeds 4,700 miles. In the United States there are upwards of 4,000 m. of C., of which 1300 m. are in New York state. The C. system has also been very extensively carried out in France, which has a large mileage of artificial inland water navigation. A new canal, which shortens the distance from Amsterdam to the North sea to 15 m., has recently been completed. The harbor is near Wyk-aan-Zee, and the minimum width is to be 80 yards. This canal was constructed mainly by British capital and engineers.

Laws regarding Canals.—The traffic, and generally the rights, duties, and liabilities of canal companies are regulated by two acts of parliament, the 8 and 9 Vict. c. 42, and the 17 and 18 Vict. c. 31, called "the railway and canal traffic act, 1854." The word *canal* is declared to include any navigation whereon tolls are levied by authority of parliament. and also the wharves and landing-places used by such canal or navigation; and *traffic* is defined as including not only passengers and their luggage, but also goods, animals, trucks, boats, and vehicles of every description. All tolls and charges in respect of the traffic are to be charged equally to all persons. It is declared to be the duty of canal companies to make arrangements for the receiving and forwarding of traffic without unreasonable delay and without partiality, and facilities are given for a remedy to parties complaining of want of attention in these respects.

According to section 7 of the 17 and 18 Vict. c. 31, companies are liable for neglect or default in the carriage of animals or goods, although they may have given notice to the contrary. Where the effect of such neglect or default occasions the loss of or injury to animals, the act provides that no greater damages shall be recovered than as follows: for any horse, £50; for any neat cattle, per head, £15; for any sheep or pigs. per head, £2, unless at the time of delivery for transit, the animals were declared to have been of higher value. No special contract between the company and parties employing the canal shall be binding on the latter unless signed by them. The act saves the rights, privileges, and liabilities of companies under the carriers' act, the 11 Geo. IV. and 1 Will. IV. c. 68.

Injury to canals, with intent to obstruct the navigation, is punishable with penal servitude for not more than seven, or less than three years; or imprisonment for two years, with the addition of hard labor, solitary confinement, and whipping, at the discretion of the court. See CARRIERS.

CANAL (*ante*). Since the great extension of railroads in the United States, the building of canals has been suspended, except for mining or manufacturing purposes.

For purposes of transportation none have been commenced and very few enlarged or improved within the past half-century. The whole length of canals in the union is about 4,200 m., of which New York has over 1300 m., Pennsylvania 920, Ohio 800, Indiana 374, Virginia 225, etc. The most important is the Erie in New York, 363 m. long, connecting lake Erie with the Hudson river, finished in 1825 and enlargement finished in 1862, at a cost of more than $50,000,000. The other large canals are the Delaware and Hudson, the great coal route to New York from the Pennsylvania mines, 108 m. long, completed in 1829, cost $6,300,000; the Chesapeake and Ohio, 185 m., cost $11,375,000; the Schuylkill Coal and Navigation company's canal, 108 m., cost $13,207,000; and the Wabash and Erie, in Indiana, 374 m., cost $6,000,000. There are 13 canals in New York, 14 in Pennsylvania, 5 in Ohio, 4 in Virginia, 2 in New Jersey, and 1 each in Delaware, Maryland, Indiana, Illinois, and Michigan. The Chesapeake and Ohio canal originated in a project formed by Washington as early as 1774, to make the Potomac navigable from tide-water to Cumberland, and to connect it by common roads and portages with the affluents of the Ohio w. of the Alleghanies. The war of the revolution postponed the scheme, but in 1784 it was again broached by Washington, and Maryland and Virginia appointed a joint commission, with him at the head, to investigate the subject. The result was the incorporation of a company to make the Potomac navigable from tide-water to the highest possible point by the construction of such locks as might be necessary for that purpose. Of this company Washington was the president until his election as president of the United States compelled his resignation. The project encountered many obstacles, until at last in 1820 it was abandoned as impracticable; when the board of public works of the state of Virginia took steps which led to the organization of a new company, which constructed the Chesapeake and Ohio canal from Georgetown to Cumberland, completing it in 1850. It passes through the Potomac valley to Paw Paw Bend, from which point it passes through the mountain by a tunnel 3,118 ft. long. The whole length of the canal is 184 m., its depth 6 ft., its width to Harper's Ferry 60 ft. at the surface and 42 ft. at the bottom. By means of 74 locks, 100 ft. long and 15 ft. wide, an elevation of 609 ft. is gained. All the water is supplied by the Potomac. The cost of the work was over $11,000,000.

CANALET'TO, or CANA'LÉ, the name of two Venetian painters, who have acquired a reputation for their landscapes and views of towns. The elder, ANTONIO C., b. 1697, was the son and pupil of a theatrical decorator in Venice. He studied at Rome. He painted a numerous series of excellent views in Venice, among which that of the great canal are especially admirable for their fresh coloring, faithfulness, and the invention displayed in accessory objects. He came to England by the advice of Amiconai. He died in 1768, after having acquired both wealth and fame by his representations of English scenes, several of which are in Buckingham house, and are highly admired.

BERNARDO BELLOTTO, surnamed CANALETTO, nephew and pupil of Antonio, was b. at Venice, 1724, and attained high excellence as a painter, and also as an engraver on copper. He practiced his art in his native place, and afterwards in Rome, Verona, Brescia, Milan, and Dresden. Correct perspective, powerful effects of light and shade, and beautiful sky-tints, are the most prominent characteristics of his works. C. visited England, where, among several other excellent works, he painted a masterly interior view of King's College chapel, Cambridge. He died in Warsaw, 1780.

CANAMI'NA, a t. of Dahomey, Africa, about 12 m. s. of the capital, Abomey. It is situated in the midst of a cultivated plain, and has a house for the accommodation of white men, set apart by the king. Pop. 10,000.

CANANDAI'GUA, a beautiful village in New York. U. S., at the n. of the lake of the same name, on the Rochester and Syracuse railway. Pop. '70, 4,862.

CANANDAI'GUA (*ante*), a beautiful village in Ontario co., N. Y.; the co. seat, situated at the n. extremity of Canandaigua lake, 24 m. s.e. of Rochester, on the New York Central railroad, where it is joined by the Rochester and Elmira, and the Canandaigua, Black Rock and Tonawanda railroads. The village is celebrated for picturesque scenery and the elegance of its private residences. Pop. '80, 5,726. Among the public buildings are a fine court-house, two orphan asylums, several churches, an academy, and a seminary for women. The Indian name "Canandaigua" means "the chosen spot."

CANANDAI'GUA LAKE, in Ontario co., N. Y., 15 m. long by about 1 m. wide; 668 ft. above the tide and 437 ft. above lake Ontario, into which it is emptied by the Clyde and Seneca rivers. It is surrounded with high banks and charming scenery, and its steamboats are largely patronized by pleasure-seekers.

CANANO'RE, a seaport and military station of the district of Malabar, in the presidency of Madras. It is in lat. 11° 52′ n., and long. 75° 26′ e., being about 50 m. to the n. of Calicut. The town stands at the head of a bay, which, opening from the s., forms its harbor, while the fort and cantonments occupy the bluff headland, which shelters the inlet on the side of the Arabian sea. Besides pepper, grain, and timber, the neighborhood produces immense quantities of cocoa-nuts, which are largely exported to the northward, where they are said to be scarce. C. has been a British possession since 1791, having in that year been taken from Tippoo Sultan. Pop. '71, 31,070.

CANA OF GALILEE, called by the natives "Kefr Cana." This place, celebrated in Scripture as the scene of our Lord's first miracle, when he turned water into wine, is now a small village of a few hundred inhabitants, who are principally Greek Christians or Nazarenes, situated about 13 m. w. of the sea of Galilee, and 6 m. n. of Nazareth. At the entrance to the village there is a fountain of the clearest and most delicious water—the best, say the Christians of Palestine, in the world: from it, it is supposed, the vessels for the marriage-feast were filled; and near the fountain are also lying the fragments of a Roman column. A house is still shown as that in which the miracle was performed; and some earthen jars sunk into the floor are said to be the very jars in use on that day. A church was built over the spot, but it is now in ruins.

CANARA, a region on the w. coast of the Indian peninsula, comprising two British collectorates. North C., also called *Honawar*, the most southerly portion of the Bombay province, is, like the other districts in the coast southwards, exceedingly fertile. The area of the district is 4,235 sq.m., and the pop. was 398,406 in 1872. South C., a narrow strip of hilly and very fertile country, lies in the Malabar like the preceding, but is comprised for administrative purposes in the province of Madras. It is sometimes called *Mangalore*, from its chief town. Area, 3,902 sq.m.; pop. in 1871, 918,362.

CANARAC, a t. on the Orissa coast, at the n.w. angle of the bay of Bengal, in lat. 19° 54′ n., and long. 86° 10′ e., being 235 m. to the s.w. of Calcutta. It is remarkable chiefly for the remains in its vicinity of a colossal pagoda. The entire area, a square of about 13 acres, is said to have been surrounded by walls 150 cubits high and 19 broad; and the principal materials appear to have been red granite and black basalt, some of the blocks measuring 15 or 16 ft. in length, by 6 or 8 in width, and 2 or 3 in thickness. Most of the sculptured embellishments have been removed to the temple of Juggernaut, which is in the same district of Pooree as C. itself.

CANA'RIES, or Canary Islands, a group of islands belonging to Spain in the Atlantic ocean, off the n.w. coast of Africa, in lat. 27° 40′ to 29° 25′ n., and long. 13° 25′ to 18° 16′ w., forming a Spanish province. The group consists of seven large and several small islets, with a joint area of about 3,800 sq. m., and a pop. of (1877) 283,859. The principal islands, proceeding from e. to w., are Lanzarote, Fuerteventura, Gran Canaria, Teneriffe, Gomera, Palma, and Hierro or Ferro. The coasts are steep and rocky, and the surface is diversified with lofty mountains (the greatest elevation being attained in the *Pico de Teyde,* in the island of Teneriffe, which has a height of 12,182 ft.), narrow gorges, and fertile valleys. All the islands are of volcanic origin. On the summits of the highest elevations, depressions, like those left by fallen cones of volcanoes, are almost everywhere found; and the steep declivities are marked by deep fissures, of which, usually, only one penetrates the depressed summit, and exposes to view the several strata of the volcanic rock. There are numerous torrents, but no rivers, and fresh water is very scarce in the southern parts of the islands, and especially in Hierro.

The researches of Humboldt and Von Buch led to the division of the botanical geography of Teneriffe into five distinct regions. The first, or region of African forms of vegetation, extends to about 1300 ft. above the sea, and is marked by the growth of the date palm, sugar-cane, dragon's-blood tree, etc. The second region extends to the height of 2,800 ft., and produces vines, corn, maize, olives, chestnuts. etc., in luxuriance. This zone represents the vegetation of southern Europe. In the third region, rising 1200 ft. or so higher, we have laurels and evergreens. In the fourth, extending to above 6000 ft., we find vegetation nipped by cold and excessive dryness, snow falling several months of the year, and only the *pinus Canariensis* and other coniferæ flourishing. The fifth region attains an elevation of nearly 11,000 feet. Here are found a kind of *spartium* (broom) peculiar to this zone, with cedrine junipers, and one Alpine plant, *Arabis Alpina.* The barren mountain-peaks are just below the limit of perpetual snow, although in a cavern at the height of 11,000 feet above the sea, snow is said to be preserved throughout the year. All the rest of the islands are similar in character, with the exception of Fuerteventura and Lanzarote, which are less elevated, more abundantly wooded, and more luxuriant in vegetation generally.

Minerals are few, and of little importance. Near the sea, the general temperature ranges from 60°–66° F. in Jan., to 78°–87° F. in October. The rainy season lasts from Nov. to Feb.; from April to Oct., the weather is uniformly fine. The islands, however, suffer much from the e. and s.e. winds, which, blowing over the hot deserts of Africa, burn up vegetation, and generate disease. Very little wine is now produced, the grape disease having destroyed almost all the vines. Cactus plants, on which the cochineal insect feeds, now mainly occupy the desolated vineyards, and the value of cochineal exported in 1874 was £435,000, out of a total value for exports of £596,244. Other products are cereals, tobacco, potatoes, barilla, oil, and fruits. The chief foreign trade is with the United States, England, and Hamburg. There is little manufacturing.

Teneriffe, the largest island of the group, has an area of 877 m., with a population of 95,000.* In the n.w. of this island, which is the principal seat of the cochineal cul-

* The population of the separate islands is not from the census of 1870, of which only the total return is available.

tivation, is situated the famous Pico de Teyde, or peak of Teneriffe (q.v.). The chief town and port is Santa-Cruz de Santiago (q.v.), on the n.e. coast.

Gran Canaria, which is next in importance, has an area of 758 sq.m., with a pop. of 69,000. Its culminating peak is El Cumbre, with a height of 6,648 feet. The capital, Las Palmas (q.v.), on the e. coast, is the largest town of the archipelago.

Palma has an area of 718 sq.m., and a pop. of 33,000. Its highest peak, Pico de los Muchachos, has an elevation of more than 7,600 feet. Capital, Santa-Cruz des las Palmas (q.v.), on the e. coast.

The area and population of the other islands are as follows: Lanzarote is 323 sq.m., pop. 17,400; Fuerteventura, 326 sq.m., pop. 13,800; Gomera, 169 sq.m., pop. 11,700; Hierro, 82 sq.m., pop. 4,400. The chief towns of these islands are small.

The C. are supposed to have been the Fortunate islands of the ancients. The Carthaginians are said to have visited them, and Juba II., king of the two Mauritanias, wrote an account of them that has been transmitted to us by Pliny. In modern times, the first account of them was furnished in the first half of the 14th c., by the crew of a vessel that had been driven among them by stress of weather. A Spanish gentleman obtained a grant of them from the pope; but when an attempt at settlement was made, the Spaniards were driven off by the natives. In the beginning of the 15th c., the Spaniards succeeded in obtaining a footing in the islands; but a difference having arisen with Portugal concerning them, it was not until 1493 that the authority of Spain was finally established. Since that time, they have remained attached to the Spanish crown. The Guanches, who were the aborigines of the islands, have long ceased to exist as a separate people, the population being now quite Spanish. They were a brave and intelligent race.

CANARIS, Constantine. See page 888.

CANA'RIUM, a genus of trees of the natural order *amyridaceæ*, natives of the south-eastern parts of Asia, the Malayan archipelago, etc. The fruit is a drupe. The kernel of the fruit of *C. commune* is eaten both raw and roasted; and in Amboyna, bread is made of it, which is generally in the form of rolls about a yard long and an inch thick. An oil is expressed from it, which is used both for the table and for lamps. The tree is about 50 ft. high. *C. sylvestre* also produces eatable kernels. *C. commune* is supposed to be one of the trees which yield elemi (q.v.), and *C. microcarpum* yields an oil very like copaiva, known in ship-building yards as damar (q.v.).

CANARY, or Canary Bird, a beautiful little bird, very common as a cage-bird, and much esteemed for its musical powers. It is one of the numerous family of finches (*fringillidæ*), and is *fringilla canaria* of Linnæus. Some modern ornithologists place it in the genus *carduelis*, others in *linota;* it is indeed intermediate between these genera, the goldfinches and the linnets. Some make it the type of a genus or sub-genus, *canaria.* It is found in Madeira, the Canary isles, and the Cape Verd isles; frequents the neighborhood of human habitations; builds its nest of moss, feathers, hair, etc., in thick, bushy, high shrubs or trees; and produces four, five, or even six broods in a season. In its wild state, its plumage is greenish, or greenish-yellow, sometimes tinged with brown, and exhibits less variety and beauty than in domestication. It was brought to Europe in the beginning of the 16th century. It breeds readily in confinement, and seems thoroughly reconciled to its cage-life; but although canaries of long domesticated races sometimes excel in imitative powers and acquired strains, yet they are surpassed in loudness and clearness of note by some of the wild birds, which, when caught and imported, are occasionally sold for extraordinary prices. Even in confinement, the C. often breeds four or five times a year, laying from four to six eggs each time. The eggs are pale blue. The male assists the female in building the nest and in feeding the young. Besides seeds of various kinds, which are their principal food, canaries are very fond of bland green leaves, such as those of chickweed, a supply of which is very necessary for their health; and one of their favorite luxuries is sugar. The C. not unfrequently lives 15 or 16 years. It can be taught various notes and airs, and some even learn to articulate words. The rearing and training of canaries afford occupation to no small number of persons, particularly in the Tyrol. The C. hybridizes readily with some other species of finch, producing "mules," some kinds of which are valued as song-birds.—There are several species very closely allied to the C., one of which, a beautiful little bird, entirely yellow, with an orange crown, a native of Brazil, is sometimes sold in Britain as a song-bird, but its musical powers are very inferior to those of the common species.

CANARY GRASS, *Phalaris canariensis,* a grass of which the seed is much used, under the name of *Canary seed,* as food for cage-birds, and which is, on that account, cultivated to some extent in the s. of Europe, and in certain districts of Germany and England. It is a native of the Canary islands, naturalized in the s. of Europe, and in many places in Britain. The chief seats of its cultivation in England are the counties of Kent and Essex. The seed is sown early, generally in Feb., yet the crop is not reaped till after the ordinary grain harvest, for which reason the cultivation of C. G. is seldom attempted in the northern parts of Britain.—This grass attains a height of 2 or 3 ft., and has a crowded, egg-shaped, spike-like panicle, from an inch to almost 2 in. long; the spikelets are one-flowered, very much laterally compressed, a rudimentary scale-like floret on each side of the perfect floret; the *glumes* winged on the keel, and with two strips of

darker green on each side; the *paleæ* awnless, shining, and at last firmly inclosing the seed. A fine flour is prepared from Canary seed, which is employed as dressing in fine cotton-weaving, and for the finishing of silken stuffs. The groats and flour of this small kind of grain are also used in the Canary islands, in Barbary, and in Italy, as food, the flour being made into bread, which is very nutritious and pleasant.—Other closely allied species of *phalaris* produce a similar grain, but are inferior in productiveness and quality.—A grass, now generally referred to this genus, and sometimes called REED C. G. (*phalaris arundinacea*), is very common on the banks of lakes and rivers, and in other wet places in Britain, and throughout southern and central Europe. It differs very much in appearance from C. G., having a large spreading panicle, generally of a reddish color; and the glumes are not winged at the keel. It is a somewhat reed-like grass, 4 to 6 ft. high, with creeping roots, which help to secure river banks; and yields a great bulk of hay, but has been very generally despised as a coarse grass, fit only for littering cattle. The justice of this opinion has, however, been called in question, and the grass proclaimed to be very nutritious, and sufficiently acceptable both to horses and oxen when cut early. It may be mown twice a year. A variety with curiously striped leaves is well known in gardens, as *ribbon grass, gardeners' garters,* or *ladies' traces.*

CANARY PLANT. See TROPÆOLUM.

CANARY WINE, also known as TENERIFFE, is the produce of the Canary islands, and resembles Madeira; but the name is properly applied only to the Bidogne wine, which must be distinguished from the Malvoisie of the Canaries. The former is made from grapes gathered before they have ripened, and, when new, is crude and unpleasant; but in the course of two or three years, increasing in mildness as in age, becomes so much like Madeira, that it is often sold for it. Like Madeira, it is greatly improved by a voyage to the tropics. It is produced chiefly on the island of Teneriffe, and the trade in the wine is mostly carried on at the chief port of this island. The Canary of the island of Palma is inferior to Teneriffe, but may be consumed sooner, and has a pleasant flavor.

CANAS'TER, the name given to a rush basket in which tobacco is placed in Spanish America; hence is said to be derived the name canaster, now applied to tobacco of a certain kind.

CANBY, EDWARD RICHARD SPRIGG, LL.D.; 1819–73; b. Ky.; a graduate of West Point; served in the Florida and the Mexican war, and in the war of the rebellion; in 1862, made brig.gen. of volunteers, and maj.gen. in 1864. He was severely wounded on two occasions, and was often chosen for special and difficult duty. In 1866, he was commissioned as brig. in the regular army. In the winter of 1872–73, he was sent to make a settlement of the difficulties between the Modoc Indians and the whites of n. California and Oregon, and was holding a talk under a flag of truce near his camp when he was treacherously shot by capt. Jack, one of the Modoc leaders.

CANCALE, a seaport of France, 10 m. e. of St. Malo, on the bay of St. Michael; famous for its oyster trade; pop. '72, 3814. In 1758, the duke of Marlborough here landed an English army of 14,000, intending to attack St. Malo, but returned without making the attempt.

CANCAN, a wild dance, or rather a series of violent gymnastic exercises, originated by the demi-monde of Paris. Though perhaps quite as decorously clad as the opera-ballet, the C. is considered out of the pale of respectable diversions. There is some resemblance between it and the wild orgies of the Bacchic or Dionysian festivals of ancient Greece.

CANCAO', CANCAR, or KANG-KAO, also known as PONTHIAMUS or POTAIMAT, the capital of a small state in w. Cambodia, on the e. side of the gulf of Siam, at the mouth of the river Cancao, 10° 14′ n. and 105° 55′ east. It was once the center of Cambodian trade, but in 1717 the Siamese drove out the merchants who had settled there, since which time the trade of the town has greatly decreased. The harbor is shallow, but there is a good depth of water in the river.

***CAN'CELING OF DEEDS AND WILLS.** The word cancel comes from the Lat. *cancelli* (lattice-work), and a deed was formerly said to be canceled when lines were drawn over it in the form of lattice-work. The word cancel is now used to signify any sort of obliteration.

The court of chancery in England gives relief against the effect of improper cancellation; on the other hand, it may order a deed which has been improperly obtained to be delivered up in order to be canceled. The effect of the cancellation is to make the deed void. If a deed is given up to be canceled, and the cancellation does not take place, it remains in force at law. But if an obligee deliver up an obligation to be canceled, and the obligor do not afterwards cancel it, and the obligee happen to get it again into his hands, and sue the obligor on it, the latter cannot plead its voidance, for the deed still remains in force at law—although here, too, equity would relieve, and decree according to the original cancellation. Where a deed is canceled by consent of the parties to it, it is thereby destroyed as to their interest under it, but third parties may still produce it in evidence. As to a will, its cancellation may have the effect of revoking it, if done with such intention.

In Scotland, the system of registration of deeds and other writings prevents the

occurrence of many of the questions that arise in England on this head, but the intention and effect of the cancellation or destruction of documents would in most cases be a question of evidence; and where it is necessary to know the contents of the destroyed paper, its effect may be judicially declared by a form of suit called an action for *proving the tenor*, as indeed may be done in an English court of equity by a bill to recover the contents of a lost document. In the Scotch law, again, a deed or other writing may be judicially canceled or set aside by an action of reduction, and the courts in England substantially exercise a similar jurisdiction.

It would appear that where a testator has prescribed certain forms for the authentication of his will, and such forms have either not been observed by him, or if observed, have, in some essential particular, been negatived by obliteration, an intention to revoke will be presumed: thus, where a Scotchman, who had long resided in India, executed a will, concluding, "In testimony of this being my last will and testament, I hereto set my hand and seal;" and the document was found in his repositories with the part to which the seal had evidently been affixed cut (not torn) off, the house of lords held the deed to be canceled, because the testator had himself, besides the usual solemnities, prescribed a seal as necessary to the authentication of his will. A will, however mutilated or canceled by a testator during his insanity, would be good; and of course there is no effectual cancellation when done by a third party without sufficient authority. But all such considerations are questions of evidence. See DEED, WILL.
See *Supp.*, page 888.

CANCELING OF LETTERS-PATENT. The lord chancellor may cancel the queen's letters-patent, when granted contrary to the law, "which," says Blackstone, quoting sir Edward Coke, "is the highest point of his jurisdiction." See LETTERS-PATENT, CHANCELLOR.

CANCELLA'RIA, a genus of mollusks—class *gasteropoda* (q.v.), order *pectinibranchiata*—with univalve shells, sometimes regarded as belonging to the family *volutidæ*, or volute shells (q.v.), but now generally placed among *buccinidæ*, or whelks (q.v.). The spire is prominent, the last whorl ventricose, the surface reticulated, the mouth large, the columella plaited. All the recent species are natives of tropical or subtropical seas, and are found chiefly on sandy bottoms, at the depth of a few fathoms. The fossil species, amounting to 19, occur in the newer strata from the chalk upwards.

CANCER, a disease characterized by slow alterations of structure, or tumors in various parts of the body, occurring either simultaneously or in a certain order of succession. In many cases, an isolated tumor in an external part is the earliest symptom; it is then viewed at the starting-point of the disease, and is termed a *malignant tumor* (*tumor mali moris*), from its presumed tendency to infect the system, and to cause the reproduction of growths similar to itself. It is right, however, to remark, that upon the pathology of C. authorities are by no means agreed, some holding that a constitutional taint or *diathesis* must always precede any local development of C., and that the first growth in point of time (or primary C.) is therefore only the first of a series determined by a pre-existing cause in the blood or general system; while others hold that C. is originally a truly local disease, or even that a growth at first simple (*non-malignant* or *benign*), may, in consequence of local causes, *degenerate*—i. e., become cancerous, and infect the whole system with the morbid tendency thus secondarily acquired. The discussion of this disputed question involves statements of a too complicated kind to be in place here; but it is a question of considerable importance, as bearing on the probability or improbability of curing the disease by extirpating the primary tumor at an early stage of its development. All authorities are agreed that, when any trace of secondary C. exists, the removal of the parts affected gives scarcely any hope of a favorable result, and, accordingly, operations under these circumstances, unless merely for the relief of local suffering, are discountenanced by all respectable surgeons. The disease, however, is one of which the ignorant as well as the learned have a well-founded dread, and hence it presents a large field for the practice of imposture, and for that less deliberate, but often not less hurtful kind of quackery which is the result of pure ignorance, grafted on a meddlesome desire to do good. We propose to give such a sketch of the characters and progress of cancerous disease as may serve, in some degree, as a protection against ignorance on the one hand, and deception on the other.

The leading character of C. being a tumor or morbid growth in a part, it is important, in the first place, to observe that not all, nor even the majority, of morbid growths are cancerous. A very large proportion of growths, involving swelling or change of structure in a part, are either determined by a previous process of inflammation—leading to chronic abscess and induration—or belong to what is called the non-malignant order of tumors—e. g., cysts, fatty and fibrous tumors, simple hypertrophy of glandular structures, cartilaginous, bony, calcareous, and vascular growths. See TUMORS. Further, among the tumors admitted by general consent into the order of cancerous, there are widely different degrees of *malignancy* or *cancerousness*, so to speak; some having the tendency to spread rapidly, and infect the system at an early period, while others remain local for a considerable time, and may be removed while yet local, with good hope of a permanent recovery.

Now, the practical distinction, or *diagnosis*, to use the technical phrase, of these different tumors, is founded upon a very careful and delicate appreciation of the characters

of the malignant and non-malsgnant tumors, considered as morbid products, and also upon a thorough knowledge of the anatomy and relations of the textures in which they arise. One of the leading characters of malignant tumors is the tendency to involve, by a kind of specific destruction or degeneration, the ultimate elements of the textures in which they arise and in which they spread. The attempt, therefore, to distinguish these from other growths, must always call for the highest qualities of the surgeon—large experience, guided at every step by consummate science, and, in particular, by minute and thorough knowledge of natural structure. And the difficulties of the inquiry are such, that even in the dead body, or in a tumor excised from the living body, all the resources of the anatomist, aided by the microscope, will occasionally fail in distinctly and surely discovering the true character of the morbid structure.

The most common seats of C. are, among external parts, the female breast, the eye, the tongue, the lip, the male genital organs, and the bones; among internal organs, the liver, stomach, uterus, rectum, gullet, peritoneum, and lymphatic glands. Some of these parts are more liable to primary, others to secondary cancer. Thus, the female breast, the neck of the uterus, the lower lip, the scrotum, the extremity of the penis, are very often the seats of a single cancerous tumor, which in its early stage at least seems to be unconnected with any constitutional taint; while the liver, the bones, and the lymphatic glands are more frequently the seats of secondary or multiple cancerous tumors. There are also differences in the character of C. itself, apart from its anatomical seat, which are to be taken into account in estimating the probability of its being solitary. Some of these differences are regarded by pathologists as amounting almost to specific distinctions; thus, *scirrhus*, or hard C., observed most frequently in the breast, uterus, and stomach, is more frequently solitary than *encephaloid* (brain-like), otherwise called *medullary*, or soft C.; again, *melanosis*, or *melanic C.*, a variety charged with a brown or black pigment, is almost always multiple in its occurrence; while *epithelial C.*, or *epithelioma*, as it has been recently termed, of which examples are frequently found in the lip, scrotum, penis, or tongue, is so generally solitary as to have led some pathologists to place it in a class altogether apart from the truly cancerous growths, with which, however, it presents too many points of affinity in its fatal tendency to recur after operation, and to infect the lymphatic glands and other structures adjoining the part primarily affected. Again, there are certain varieties of fibrous and of cartilaginous tumor, as well as certain tumors of bone, and bone-like tumors developed in soft parts (osteoid), which must be regarded, in the meantime, as occupying a doubtful position between the malignant and non-malignant growths. (Paget, *Lectures on Surgical Pathology*, vol. ii.)

Generally speaking, a tumor may be said to fall under the suspicion of being C. when it more or less completely infiltrates the texture in which it arises, and passes from it into the surrounding textures; when it invades the lymphatic glands adjoining the part first affected; when it is attended by stinging or darting pains, or by obstinate and slowly extending ulceration, not due to pressure; when it occurs in a person having impaired health, or past the middle period of life, and is not traceable to any known cause of inflammatory disease or local irritation, nor to any other known constitutional disease, such as syphilis or scrofula. The probabilities are of course increased if the tumor be in one of the habitual seats of C., or if it be attended by evidence of disease in some internal organ known to be frequently thus affected. But it is hardly necessary to point out that the very complex elements of *diagnosis* here referred to ought to be always submitted to the scrutiny and judgment of a well-educated medical adviser, whose skill and personal character place him above suspicion, before the disease has assumed such a form as to be beyond the reach of remedial procedure. The patient who broods in secret over a suspicion of C., or who declines to apply for advice from a fear of encountering the truth, is in all probability only cherishing the seeds of future suffering; while if, as often happens, the suspicion is unfounded, a few minutes' careful examination would suffice to remove a source of misery which otherwise would poison the mind for years.

These remarks apply still more emphatically to the misguided persons who trust to the non-professional *cancer-curer*, or to the quasi-professional specialist. The charlatan, who pretends to hold in his hands a secret remedy for this most terrible disease, will invariably be found to pronounce almost every tumor C., and every C. curable. By this indiscriminating procedure, and by the fallacious promise of a cure without an operation, many persons who have never been affected with C. at all, have been persuaded to submit to the slow torture of successive cauterizations by powerful caustics, at the expense of needless mutilation and no small risk to life. In other cases, truly cancerous tumors have been removed slowly and imperfectly, at the cost of frightful and protracted sufferings, only to return at the end of a few weeks; and Mr. Spencer Wells has lately shown that in some notorious instances persons were reported as cured, when they had actually died of the disease at no long period after the supposed cure was stated to have taken place. (*Cancer and Cancer-curers*, Lond. 1860.)

What is really known as to the cure of C., may be stated in few words. Modern pathological researches render it probable that a complete suspension of the progress of C. sometimes, though rarely, takes place; and individual tumors are found not unfrequently to undergo partial healing, or even to become entirely metamorphosed into inert

cicatrices, while others, associated with them, continue to advance. The degree of rapidity of the advance of C. is also, as we have already stated, exceedingly variable. But these observations modify only to a very slight degree the general doctrine, that C. is a disease tending to a fatal issue, and hardly, if at all, under the control of remedies, as to its ultimate result. The removal of a cancerous tumor, indeed, is still resorted to by surgeons; and there appears to be no reasonable doubt that, when performed early, and in well-selected cases, it has been followed by long-continued exemption. But the occasional spontaneous arrest of such growths on the one hand, and the doubtful results of operation in a large proportion of cases on the other, have combined to render surgeons of late years more chary of the use of the knife. In aged persons, in particular, the question often resolves itself into a calculation of the chances of life, founded on a great number of conflicting data, and only to be solved by a careful attention to the state of the general health, as well as to the rate of progress of the local disease. Operations are now very rarely performed after the lymphatic glands are involved, or when there is evidence of a deteriorated constitution, or of internal disease; but sometimes great pain, or profuse and exhausting discharge from an external tumor, may justify its removal, as a palliative measure, even under these unfavorable circumstances. For the mode of removal of cancerous and other tumors, see TUMORS.

Among the lower animals, this disease is more rare; nevertheless, cases are not unfrequent, presenting the same malignant characters as those observed in the human subject. Usually manifesting itself in the form of a specific tumor of some organ or tissue, there is a tendency to the invasion of other parts of the system, and the development of a constitutional state called the cancerous cachexia. M. U. Leblanc of Paris, the best veterinary authority on this subject, has shown that the dog and cat are most frequently affected with C.; and next in frequency come the pig, ox, horse, and mule. It has not been observed in birds, reptiles, or fishes. Females are more liable to C. than males. It is hereditary, but not transmissible from animals to man, or from one animal to another. It does not disappear under the influence of remedies, but, if possible, the tumors should be excised when first seen, and, if the knife fail to extirpate the malady, cauterization should be had recourse to. A relapse is almost certain; but Leblanc says there is greater chance for the patient, when a carnivorous animal, if it is kept on a strictly vegetable diet.

CANCER, the *Crab*, the fourth of the twelve constellations of the zodiac, usually represented on the globe as a crab, and denoted in works on astronomy by the sign ♋, which resembles the number 69 laid sideways. It contains, according to Flamsteed, 83 stars, of which the principal is *Acubens*, a star of the third magnitude. In the divisions of the ecliptic, the *sign* called C. occupies a place between 90° and 120° from the vernal equinox; but, owing to precession, the sign and the constellation have not coincided for nearly 2,000 years. See ECLIPTIC, PRECESSION, ZODIAC. Besides Acubens, it has two stars of the fourth magnitude, called by the Romans *Aselli* or the Little Asses; and a nebulous cluster of minute stars about 2° from the Asses, visible to the naked eye, and which goes by the name of *Præsepe*, or the Manger.

CANCER. See CRAB.

CANCER, TROPIC OF. See TROPICS.

CANCER ROOT, or BEECH-DROPS, *Epiphegus Virginiana*, a parasitic plant of the natural order *orobancheæ* (q.v.), a native of North America, growing almost exclusively on the exposed roots of beech-trees. Like all the other plants of its order, it has a curious appearance, having scales instead of leaves. Its stem is branching, and produces distant alternate white flowers, streaked with purple. The whole plant is powerfully astringent; and the root is brownish, spongy, and very bitter and nauseous in taste. It has acquired, in its native country, the reputation of being a cure for cancer. All parts of the plant are used, and externally more than internally. This plant, in conjunction with white oxide of arsenic, is believed to have formed a medicine once famous in North America under the name of *Martin's cancer-powder*.—Another American plant of the same order, *Phelipæa biflora*, is sometimes also called C. R., and is used in the same way; and an infusion of the common broomrape (*orobanche major*)—a native of Britain and of the s. of Europe, parasitic on the roots of broom, furze, and other leguminous plants—has been employed as a detergent application to foul sores.

CANCRIN′, GEORG, Count, 1774–1845; a Russian statesman, educated in Germany, and employed in various capacities in Russian service. In 1813, he was commissary-gen. of all the forces, and in 1814, he accompanied the emperor Alexander to Paris. He was minister of finance from 1823 until his death. He was one of the few Russian writers on political economy.

CANCRUM O′RIS, known also as *noma*, *water-cancer*, and *water-canker*, is a peculiar form of mortification, arising apparently from defective nutrition. The disease seldom occurs except between the 2d and 11th years, and is usually preceded by measles, remittent or intermittent fever, or some other serious disease. The following is the ordinary train of symptoms: more or less general disturbance of the system, accompanied by loss of appetite, followed by swelling of the salivary glands, and a profuse flow of saliva, which escapes from the mouth involuntarily during sleep; ulceration of

the gums, which swell and become livid; looseness of the teeth; and the appearance of ash-colored spots on the gums and adjacent mucous membrane, which turn into dark-colored sloughy sores. These sores spread rapidly by a gangrenous process, expose the bone, and finally make a large aperture in the cheek. In some cases, the entire cheek has been destroyed in a very few days. Fortunately, this terrible disease is more rare in this country than in some parts of the continent, and most of the cases recorded are described by foreign writers. Van Swieten describes a case in which he saw the first set of teeth fall out, the second set destroyed, the lower jaw exfoliated, and the lips, cheeks, tongue, and chin eaten away before the child died. The obvious indications of treatment are to remove the patient to pure air, to administer tonics, nourishing food, and (in moderation) stimulants; to touch the diseased parts with nitrate of silver, or glyceride of carbolic acid, and to wash out the mouth frequently with a weak solution of Condy's fluid.

CAN'DACE, queen of the portion of upper Nubia called by the Greeks Meroë, probably corresponding with the present province of Athbara, between 13° and 18° north. From its fortunate situation, Meroë became one of the richest countries in the world. Candace appears to have been the name of several female rulers in Ethiopia. The one here meant invaded Egypt 22 B.C., but was defeated by the Roman governor, Petronius, who destroyed Napata, the queen's capital city. The queen was leniently treated by Augustus. The high chamberlain or treasurer of Candace was converted to Christianity by Philip the evangelist, and there is a tradition that through the efforts of this officer the queen herself was converted.

CANDAHAR', or KANDAHAR, a mountainous province of Afghanistan, s.w. of Cabool. It is for the most part sterile, though there are fruitful belts along the rivers where tobacco, grain, and fruits are produced. A large transit trade passes through C. between India and Persia. Candahar once formed a part of the latter kingdom; was afterwards subjected to the sovereigns of Delhi; was once more annexed to Persia, but after the death of Nadir Shah it became a province of Afghanistan. The people are Mohammedans, chiefly of the Sunni sect.

CANDAHAR', or KANDAHAR, the capital of central or southern Afghanistan, situated about 200 m. to the s.w. of Cabool. It is in lat. 32° 37′ n., and long. 66° 20′ e., and has an elevation of 3,484 ft. above the level of the sea. It is in the form of an oblong square, while all its streets run straight, and cut one another at right angles. At the point of intersection there is a large dome (*charsu*), 50 yards in diameter. Pop. variously estimated from 25,000 to 100,000. C. is well watered by two canals drawn from a neighboring river, which send to almost every street its own adequate supply; and the same means of irrigation have covered the immediate vicinity with gardens and orchards. C. is a place of great commerce, trading with Bombay, Herat, Bokhara, Samarcand, etc. Among its permanent residents, C. has a larger proportion of Afghans, chiefly of the Dooraance tribe, than any other city of Afghanistan. There are numerous Hindu and Persian merchants. About 2 m. to the northward rises a precipitous rock, crowned by a fortress impregnable to everything but heavy artillery. Here, amid all the disasters of the Afghan war, the British maintained their ground. C. has been a pivot for the history of central Asia during more than 2000 years. It is supposed to have been founded by Alexander of Macedon, owing, most probably, its name to the oriental corruption of Iskender or Scander, as in Scanderoon or Iskenderun of Syria. A comparative blank of upwards of 13 centuries in the history reaches to the famous Mahmoud of Ghiznee, who wrested the stronghold from the Afghans. From that epoch down to 1747, when the native rule was permanently established, C., with brief and precarious intervals of independence, was held by Tartary, India, and Persia in turn. In the war of 1878–79, the British entered C. unopposed.

CANDAU'LES. See GYGES, *ante*.

CANDEISH', or KHANDESH, a collectorate in the presidency of Bombay, and containing 10,166 sq.m., with a comparatively scanty pop. of (1872) 1,028,642. It lies chiefly in the valley or basin of the middle part of the Tapti, which enters the gulf of Cambay below Surat; and it is bounded mostly by territories of nearly all the powerful native princes—the Nizam, Scindia, Holkar, and the Guicowar. Through its situation, it necessarily suffered much from the long contest between the Mohammedans and the Mahrattas, and also from the struggles among the rival chiefs of the latter. Accordingly, when, in 1818, it fell to the East India company on the overthrow of the Peishwa, it presented little better than a scene of desolation, with ruined mansions, dismantled towns, and dilapidated temples. The difficulties of the new government were considerably aggravated by the Bheels, a more than half-savage race, that formed about an eighth of the population; and even beasts of prey, particularly tigers, had, under the constant influences of human strife, multiplied to an unusual extent. But the improvement was regular and steady. Peace and security reigned; so that roads, formerly hazardous for armed parties, were traversed in safety by unarmed individuals. The staple productions are cotton, wheat, and other grains, and also a little indigo. The cultivators are generally in a progressive condition, more especially in the cotton districts, and the well-watered talooka of Baglan.

CANDE'LA, a t. of southern Italy, province of Foggia, 22 m. s. of the town of Foggia Pop. 5,600. It is pleasantly situated on the summit of an eminence. The surrounding district is very fertile.

CANDELA'BRUM, a Latin word signifying properly a candlestick (from *candela,* a candle), but more frequently employed to mean a support for a lamp. There were, perhaps, no articles of furniture in which the ancients combined the beautiful with the useful to so large an extent as in their candlesticks and lamps. Candelabra usually stood on the ground, and were of considerable height—from 4 to 8, or even 10 feet. The most common were of wood; but metals of all kinds, including the precious metals, were used for their construction, and sometimes they were even adorned with gems. The candelabra found at Herculaneum and Pompeii are mostly of bronze. In the temples and palaces of the emperors, they were frequently of marble, and of great size and richness. They have usually a capacious cup at the top, either for the purpose of containing oil enough to feed a large flame, or that they might be used for burning incense. Though varying greatly in details, a general design runs through the forms of the candelabra of antiquity. They have all a foot or feet, a shaft, and a plinth on which a lamp is placed, or which is furnished with a socket for a candle. The base often consists of three feet of a lion, goat, griffin, or other animal real or imaginary. Sometimes a figure was introduced either into the body of the shaft, or placed on the top of it, in either case supporting the superincumbent portion of the C. on its head. Sometimes a figure was substituted for the shaft altogether, the receptacle for the oil being placed in one hand. In others, the shaft is a sliding one, like that of a music-stand, the object being, of course, to raise or depress the light at pleasure.

In addition to the various kinds of candelabra which, from their height, seem to have stood on the floor, the ancients had others intended to be placed on a table. These consisted either of a pillar or of a tree, and from the capital of the former, or the branches of the latter, lamps were suspended, as in the accompanying illustration, which we copy from Smith's *Dictionary of Greek and Roman Antiquities.* The C., in this instance, including the stand, is only 3 ft. high. From the size of the stand in proportion to the rest of the C., it would seem to have been used for some other purpose.

CANDIA, in Turkish, "Kirid'," called in the most ancient times *Idæa,* afterwards *Crete,* one of the largest islands of the Mediterranean, is situated at the entrance of the archipelago, in long. 23° 40′ to 26° 40′ e., lat. 34° 50′ to 35° 55′ north. It is very irregular in form, its length being about 160 m., and its breadth varying from 6 to 35 miles. The history of C. commences with Greek mythology, and historians and poets say that it was governed by its own kings, among whom were Saturn, Jupiter, and Minos, 1300 years before Christ. C. was conquered by the Romans under Metellus, who, on that account, had the title of "Creticus;" on the division of the empire, it fell to the share of the eastern monarchs. In 823 A.D., it was conquered by the Saracens, who built the city of C. on the ruins of Heraclea. In 1204, it was sold by pope Boniface—to whom Baldwin I. gave it—to the Venetians. In 1645, the Turks besieged Canea, and in 1669 conquered the island, after a war, which lasted 24 years. The Cretans sigh for a union with Greece, and have repeatedly risen in insurrection against Turkish rule, notably in 1866. At the Berlin congress in 1878, the porte engaged scrupulously to carry out in C. the reformed system of government drawn up in 1868.

The island of C. is for the most part mountainous, the mountains being chiefly composed of freestone or marble, which is either gray or white. Towards the s. side of the western part of the island, there is a chain of high mountains, extending in length about 37½ m., which, from their appearing white, especially at their w. end, were anciently called Leuci. Mt. Ida, now called by the natives Upsilorites, is one in a chain of mountains extending to the n.w. of the island almost to Retimo; the mountain is of gray marble, and the surface loose stones: there is no verdure on it except a few small shrubs. Jupiter is said to have passed great part of his youth amongst these mountains in the exercise of hunting and drawing the bow.

The island abounds in springs and fountains, which are found even by the sea-side; most of the rivers are dry in summer, but in winter many of them are very dangerous torrents. The island does not produce any minerals of importance. The soil of C. is fertile, and produces wheat in abundance. The exports, which consist chiefly of oil, wool, linseed, and fruit, amount in annual value to above £400,000, and the imports to about £440,000.

C. had once, according to Homer in his *Odyssey,* 90 cities; there are now only 3 principal towns: Megála Kástron, or Candia, pop. 15,000, of which 5,000 are Christians; Retimo or Rhithymnos, pop. 6,000, of which 2,000 are Christians; Canea or Khania, pop. 12,000 of which 8,000 are Christians. The total pop. of the island now numbers little more than 200,000—less than half its amount at the outbreaking of the Greek revolution in 1821.

The population is for the most part of Greek descent; there are only about 70,000 Turks, with a few Arabs and Armenians, in the island. There are, however, many Greek Moslems in C., the worldly advantages which used to result from embracing Islamism having induced whole districts to abandon the faith of their forefathers; but their change of religious faith was unaccompanied by any change of language.

CAN'DIA, or MEGALO-CASTRON, formerly the capital and still the most populous city of Crete, on the n. shore of the island, 13° 20′ n., and 25° 9′ east. It is surrounded by fortifications built by the Venetians, but which are now out of repair; and much of the town has also been much injured by earthquakes. The main buildings are the pasha's palace, 14 mosques, three churches, a monastery, the bazaars, and the baths. It is the seat of an archbishop of the Greek church. The chief trade is in oil and soap, besides which there is considerable coasting commerce. There are manufactures of leather and of wine. The pop. is from 15,000 to 18,000, of whom about two thirds are Turks. Candia occupies the site of the ancient Heracleion, the seaport of Gnossus. The present city was founded by the Saracens in the 9th c.; was fortified in the 12th c. by the Genoese, and greatly strengthened by the Venetians in the following three centuries. It was taken by the Turks in 1669 after a stubborn defense by the Venetians, who lost 30,000 men. Sometimes called Canea (q. v.).

CANDIAC, JEAN LOUIS PIERRE ELIZABETH DE MONTCALM DE, 1719–26; a child of wonderful precocity, b. in Nismes, France. At four years of age he read Latin, either printed or written; at six he understood Greek and Hebrew, had a remarkable acquaintance with arithmetic, history, geography, and heraldry, and had read many of the best authors. He died in Paris at the age of seven.

CANDIDATE (Lat. *candidatus*). Among the Romans, a suitor for the office of consul, quæstor, prætor, etc., was named C. because, in appearing before the people, he wore a white (*candida*) toga without a tunic. His dress was chosen partly as an ostentation of humility, and partly as it served to display wounds received in battle. The candidature commonly lasted two years: in the first year, the C. was proved by the senate, whose decision, if favorable, was ratified by the popular assemblies; and, in the second, his name was entered in the list of candidates. During this period occurred the *ambitio*, or canvassing of voters, which often gave occasion to enormous bribery, in spite of the severe enactments passed to prevent the corruption of the electors. The elected C. was styled *designatus*.

In the early Christian church, newly baptized converts were styled CANDIDATES, on account of the white garments worn during eight days after baptism. In modern times, a German probationer or theological student who has been approved before the highest ecclesiastical authorities, is called a C.; but a still broader signification is also attached to the word, an applicant for any office whatever, religious or secular, being termed a candidate.

CANDLE, a cylinder of wax or fatty matter, with a wick, intended for giving light. Candles are made principally of tallow; also of the solid portion of palm and cocoa-nut oils, bleached wax, spermaceti, and paraffin, and other oily substances found in coal, shale, and gas-tar. They are either dipped, molded, or rolled. "Dips" are made by stretching a number of wicks upon a suitable frame, so that they may hang down at a distance from each other equal to about double the intended thickness of the C.; these are then dipped in a trough of melted tallow, and hung upon a rack until cooled, then dipped again and again, until the required thickness is obtained. The dipper has a number of frames prepared before commencing, and by the time he has dipped the last, the first is cool enough to dip again. The tallow in the trough has to be kept only a little above its melting point, for if it were much hotter, it would melt away a portion of the tallow already on the wick, instead of adding to it. Tallow-candles are much improved by being kept a year or a winter before using.

Molds, or mold-candles, are cast by pouring the tallow down a pewter tube, along the axis of which the wick has been previously fixed. These tubes are well polished in the inside, and several are fitted in a frame, the upper part of which forms a trough, into which the molds all open: thus, by pouring into the trough, all the molds are filled at once.

Wax-candles are not molded, on account of the great amount of contraction which wax undergoes in cooling, and the difficulty of drawing it from the molds. The wicks are warmed, and suspended over a basin of melted wax, which is poured over them until they acquire the proper thickness; they are then rolled, while hot, between two flat pieces of smooth hard wood, kept wetted to prevent adhesion.

Great improvements have recently been made in the manufacture of candles, and these are especially interesting from being the direct results of the progress of scientific chemistry—of theory applied in practice. All oils or fats are composed of one or more fatty acids combined with a base, called glycerine. The fatty acids constitute the combustible and more solid portion of the compound. Both acid and base are very weak, and it is a general law in chemistry, that a strong base, under favorable conditions, will separate a weaker one from its acid, by combining with the acid, and taking the place of the weak base; and a strong acid will in like manner displace a weaker one. Lime is a strong base, and being cheap, is used to separate the glycerine from the fatty acid of tallow, palm-oil, etc. This it does when the melted fat is stirred for some hours with a mixture of lime and water. The lime forms a hard insoluble soap, by combining with the fatty acid, and the glycerine remains in solution with the water. This lime-soap is then broken to powder; and the weak fatty acid separated by means of sulphuric acid,

which combines with the lime, forming sulphate of lime. The whole being heated, the fatty acid floats on the top, is skimmed off, and the candles made from it. These are called composite candles; they give a purer light than ordinary tallow, from being freed from the glycerine, which not only softens the fat, but diminishes its combustibility. Pure stearic acid, or stearine, the chief fatty acid of tallow, is a hard crystalline substance, perfectly dry, and free from any greasiness, with a somewhat pearly luster. Its crystalline structure presents a difficulty in the manufacture of candles, for when cast in molds, it contracts on cooling, and leaves small spaces between the crystals. This has been obviated by mixing a little arsenic with it; but this method is now abandoned, on account of the poisonous gas evolved by the combustion of such candles, and the desired effect is obtained by mixing the stearine with a little wax, and pouring it into hot molds.

To obviate the necessity of snuffing candles, several contrivances have been adopted; in all of them, the object is effected by causing the wick to bend over and its end to fall outside of the flame, and thus, by coming in contact with the oxygen of the air, to be completely burned—for such combustion cannot take place within the flame. See FLAME. This bending over is variously brought about. One method is by twisting the wick with one strand shorter than the rest, which is strained straight while the candles are being cast; and when released by the melting of a portion, it contracts, and bends the wick. Another method is by adding on one side of the wick a paste, consisting of a mixture of borax, bismuth, flour, and charcoal. Another, by coating one of the threads of the wick with a metallic envelope, by dipping it in fused bismuth; the metal fuses at the end of the burning wick, and forms a small globule, which bends the wick over, and is itself readily combustible at a red heat. These are called *metallic* wicks. Various other contrivances have been adopted for the same object. Price's manufactory of "patent" candles, as these improved candles usually are called, is perhaps the largest in England. It is situated at Vauxhall, in the neighborhood of London, and its economic arrangements have attracted not a little public attention. *Paraffin* (q.v.), a white crystalline body, obtained by distillation from cannel coal, etc., affords a beautifully white and clear material for candles, and having thus in a great degree the properties of wax at a much smaller expense, it has lately been much used for this purpose. *Ozokerit* is another oily mineral substance used for candles.

Candles were early introduced—with symbolical signification—into Christian worship, and are still so employed in the Roman Catholic church. In the church of England, candles are sometimes placed on the altar; but the practice is a subject of controversy. The numerous superstitious notions and observances connected with candles and other lights in all countries had a more remote origin, and may be considered as relics of the once universally prevalent worship of the sun and of fire. Numerous omens are taken from them, and they are also used as charms. In Britain, a portion of the tallow rising up against the wick of the candle, is called a winding-sheet, and regarded as a sure omen of death in the family. A bright spark at the candle denotes that the party directly opposite is to receive a letter. Windy weather is prophesied from the waving of the flame without visible cause, and wet weather if the wick does not light readily. Lights appearing to spring up from the ground, or issue out of a house, and traverse the road or air by invisible agency, the superstitious in Wales and elsewhere call *corpse-candles*. They are ominous of death, and their route indicates the road the corpse is to be carried for burial. The size and color of the light tell whether the fated person is young or old. It is or was customary in some places to light a candle, previously blessed, during the time of a woman's travail. C. were supposed to be efficacious after death as well as before birth, for they were placed on the corpse. The object was doubtless to ward off evil spirits, who were supposed to be always on the alert to injure souls on entering and on quitting the world. See also CANDLEMAS.

CANDLEBERRY, CANDLEBERRY MYRTLE, WAX TREE, WAX MYRTLE, TALLOW TREE, or BAYBERRY, *Myrica cerifera*, a small tree or shrub of 4 to 18 ft. high, but generally a low-spreading shrub, a native of the United States of America, but most abundant and luxuriant in the south. It belongs to the natural order *amentaceæ*, suborder *myriceæ*, according to some, a distinct natural order, distinguished by naked flowers, with 1-celled ovary, a drupaceous fruit (stone-fruit)—the scales becoming fleshy—and a single erect seed. The genus *myrica* has male and female flowers on separate plants; and the scales of the catkin, in both male and female flowers, are concave. The C. has evergreen oblongo-lanceolate leaves with two small serratures on each side at the point, sprinkled with resinous dots. The bark and leaves when bruised emit a delightful fragrance. The drupes—properly called berries—are about the size of peppercorns, and when ripe are covered with a greenish-white wax, which is collected by boiling them and skimming it off, and is afterwards melted and refined. A bushel of berries will yield 4 or 5 pounds. It is used chiefly for candles, which burn slowly, with little smoke, and emit an agreeable balsamic odor, but do not give a strong light. An excellent scented soap is made from it.—*M. gale* is the SWEET GALE of the moors and bogs of Scotland, well known for its delightful fragrance, a native of the whole northern parts of the world. Several species are found at the cape of Good Hope, one of which, *M. cordifolia*, bears the name of WAX SHRUB, and candles are made from its berries.

CANDLE-FISH, or EULACHON, *Thaleichthys Pacificus,* a remarkable fish of the family *salmonidæ,* nearly allied to the capelin (q.v.), and, like it, strictly a sea-fish approaching the coasts to spawn, but not entering rivers. The candle-fish inhabits the Pacific ocean, near the western shores of America, from Vancouver's island northwards. It is not larger than a smelt, has a somewhat pointed and conical head, a large mouth, teeth on the pharyngeals, and the tongue rough, but the lower jaw, palatines, and vomer destitute of teeth. The color is greenish olive on the back, passing into silvery white on the sides and belly, sparsely spotted with dirty yellow. It is probably the fattest or most oleaginous of all fishes, or indeed of animals, and is used by the Indians not only as an article of food, but for making oil. To broil or fry it, is nearly impossible, because it almost completely melts into oil. Indeed, the Indians often use it, in a dried state, as a lamp for lighting their lodges, merely drawing through it a piece of rush pith, or a strip from the inner bark of the "cypress tree" of these regions, *thuja gigantea*—a species of arbor vitæ—as a wick, a long needle of hard wood being used for this purpose, and the fish being then lighted at one end, burns steadily until it is all consumed. In order to use the dried fish for food, the Indians often melt it into oil, by the application of heat, and drink the oil. It is also eaten uncooked. Drying is accomplished without any gutting or cleaning, the fish being fastened on skewers passed through the eyes, and hung in the thick smoke at the top of sheds in which wood fires are kept burning. They soon acquire a flavor of wood-smoke, and the smoking helps to preserve them. They are then stowed away in large frails, made from cedar-bark or rushes, in order to be used for food in winter. Immense shoals of candle-fish approach the shores in summer, and are caught in moonlight nights, when they come to sport at the surface of the water, which may often be seen glittering with their multitudes. The Indians paddle their canoes noiselessly amongst them, and catch them by means of a monster comb or rake—a piece of pine-wood from 6 to 8 ft. long, made round for about 2 ft. of its length at the place of the hand-gripe, the rest flat, thick at the back, but having a sharp edge in front, where teeth are driven into it about 4 in. long, and an inch apart. These teeth are usually made of bone, but the Indian fishers have learned to prefer sharp iron nails when they can get them. One Indian, sitting in the stern, paddles the canoe; another, standing with his face to the bow, holds the rake firmly in both hands, the teeth pointing sternwards, sweeps it with all his force through the glittering mass, and brings it to the surface teeth upwards, usually with a fish, and sometimes with three or four, impaled on each tooth. This process is carried on with wonderful rapidity. When a sufficient quantity of candle-fish has been dried for winter, the rest that are caught are made into oil, being for this purpose, piled in heaps until partially decomposed, and then placed in large square pine-tree boxes; a layer about 3 deep in the bottom of each box, covered with cold water, and a layer of hot stones put in, then a layer of small pieces of wood, another layer of fish, stones, and so on. The oil is skimmed from the surface of the water in the boxes. A vast quantity of oil is thus obtained. The candle-fish is an excellent article of winter food in a climate of which the winter is severe; and notwithstanding its excessive fatness, is of agreeable flavor. It has not yet become an article of economical value to the civilized inhabitants of North-western America, but seems very likely to do so, and to acquire very considerable commercial importance.

CANDLEMAS, in its ecclesiastical meaning, is the feast of the purification of the Virgin Mary, and is observed on the 2d of February. This festival is very strictly kept by the Roman Catholic church, there being a procession with many lighted candles, and those required for the service of the ensuing year being also on that occasion consecrated; hence the name Candlemas day. In Scotland, this day is one of the four term-days appointed for periodical annual payments of money, interest, taxes, etc., and of entry to premises—the three other term-days there being Whitsunday, Lammas, and Martinmas. See TERM.

An old document of the time of Henry VIII., preserved in the archives of the society of antiquaries, London, concerning the rites and ceremonies in the English church, speaks thus of the custom of carrying candles: "On Candlemas daye it shall be declared that the bearyinge of candles is done in the memorie of Christe, the spirituall lyghte whom Simeon dyd prophecye ['a light to lighten the Gentiles'], as it is redde in the churche that daye." But an older and heathen origin is ascribed to the practice. The Romans were in the habit of burning candles on this day to the goddess Februa, the mother of Mars; and pope Sergius, seeing it would be useless to prohibit a practice of so long standing, turned it to Christian account by enjoining a similar offering of candles to the Virgin. The candles were supposed to have the effect of frightening the devil and all evil spirits away from the persons who carried them, or from the houses in which they were placed. An order of council in 1584 prohibited the ceremony in England. There is a tradition in most parts of Europe to the effect that a fine C. portends a severe winter. In Scotland, the prognostication is expressed in the following distich:

> "If Candlemas is fair and clear,
> There 'll be twa winters in the year."

Christ's presentation, the holiday of St. Simeon, and, in the n. of England, the wive's feast-day, were names given to Candlemas day. See Brand's *Popular Antiquities,* Bohn's edition.

CANDLE-NUT, *Aleurites triloba*, a tree of the natural order *euphorbiaceæ* (q.v.), a native of the South sea islands, Madagascar, Molucca, Java, etc., which produces a heart-shaped nut with a very hard shell, and a kernel good to eat when roasted, although in a raw state it possesses in a slight degree some of the active properties so common in the *euphorbiaceæ*, and is apt to cause purging and colic. It is about as large as a walnut. An excellent bland oil is procured from it, used both for food and as a lamp-oil. The inhabitants of the Society islands after slightly baking these nuts in an oven, and removing the shell, bore holes through the kernels, and string them on rushes, hanging them up in their houses, to be used for torches, which are made by inclosing four or five strings in a leaf of the screw-pine (*pandanus*). These torches are often used in fishing by night, and burn with much brilliancy. The lamp-black used in tattooing was obtained from the shell of the candle-nut. A gummy substance exudes from the candle-nut tree, which the Tahitians chew.

CANDLESTICK. The ordinary C. is so well known that no description is needed. The most important modern improvement in the C. is a contrivance for maintaining the candle at a uniform height, by means of a spring placed below the candle, and confined in the cylindrical body of the C.; this spring presses the candle upwards with sufficient force to drive it completely out, but for a collar at the top, against which the surface around the wick bears, and thus, as the candle melts, it yields to the pressure of the spring, and maintains a uniform height. The collar, when properly adjusted, also prevents the guttering to which composite candles are liable when exposed to currents of air or moved about.

CANDLISH, Robert Smith, d.d., an eminent Scottish divine, was b. in Edinburgh in 1806, entered the university of Glasgow in 1822, and was licensed as a preacher in connection with the established church in 1828. In 1834, he became minister of St. George's, Edinburgh. From this period, his public career may be said to have commenced. With intense zeal, he advocated the justice and necessity of ecclesiastical reforms, and became one of the boldest and most vigorous leaders of the popular or "non-intrusion" party. After the disruption (see Free Church), he co-operated with Dr. Chalmers and other chiefs of the newly formed denomination in organizing, consolidating, and extending its aggressive efforts. In 1845–46, he took an active part in the establishment of the evangelical alliance. In 1847, he was, when Dr. Chalmers died, appointed to the chair of divinity, in the new college, Edinburgh, but did not assume the functions of this office. In 1862, he was appointed principal of the same college. He died Oct. 19, 1873. His best known teachings through the press are *Contributions towards the Exposition of the Book of Genesis; The Atonement, its Reality and Extent; An Examination of Mr. Maurice's Theological Essays; The Fatherhood of God;* and an *Exposition of the First Epistle of St. John.*

CANDY. See Ceylon.

CANDYS (Gr.), a loose gown, worn by the Medes and Persians over their other garments. It was made of woolen cloth, which was either purple or of some other brilliant color, and had wide sleeves. In the sculptures at Persepolis, nearly all the personages are represented as so attired. A gown of a very similar kind is still worn by Arabians, Turks, and other orientals.

CANDY-SUGAR is the popular name applied to ordinary sugar when procured in large crystals by the gradual and slow cooling of a concentrated solution of sugar. See Sugar.

CAN'DYTUFT, *Ibéris*, a genus of plants of the natural order *cruciferæ*, distinguished by unequal petals, the largest being towards the circumference of the dense corymbs in which the flowers grow, and by an emarginate pouch with the valves keeled and winged, the cells one-seeded, and the cotyledons accumbent. See Cotyledon. The species are chiefly found in the countries surrounding the Mediterranean sea, and the name C. is supposed to be derived from that of the island of Candia, the name *Iberis* from Iberia (Spain). One species, *I. amara*, remarkable for its bitterness, is a doubtful native of England. Some species are slightly shrubby, some are herbaceous perennials, some annuals. Some are among the most familiar ornaments of our flower-gardens, as the annual white and purple C. (*I. umbellata*), the sweet-scented C. (*I. odorata*), and two slightly shrubby species, *I. sempervirens* and *I. semperflorens*, the latter of which, in favorable situations, continues to blossom throughout the whole winter, and pleases the eye at all seasons, both by the abundance and the perfect whiteness of its flowers.

CANE, a term sometimes indiscriminately applied to any small and smooth rod, of the thickness of a walking-stick or less; but more correctly limited to the stems of the smaller palms and the larger grasses. We thus speak of sugar C., bamboo C., etc., among the latter; whilst among the former, this name is particularly appropriated to the species of the genus *calamus*, also called rattan. To this genus belong the canes largely imported from the tropical regions of the east for making bottoms of chairs, couches, etc. See Rattan.

CANE, or Ken, a river rising in Bundelcund, near lat. 23° 54′ n., and long. 80° 13′ e., and, after a n.n.e. course of 230 m., entering the Jumna in lat. 25° 47′ n., and long. 80° 35′ east. It is too rapid and rugged for navigation; and is remarkable for the matchless beauty of its pebbles.

CANE'A, or CAN'NA, called *Khania* by the Greeks, is the chief commercial town of Candia or Crete, and is capital of a province. It is situated on the northern coast, and occupies the site of the ancient Cydonia. The present city is of Venetian origin, and dates from 1252 A.D., when a colony was sent from Venice to occupy it. The object of its foundation was to keep down the Greeks, who had been in arms, and at open war with their Italian lords, almost without intermission from the day when the Venetians first set foot on their shores. Venetian coats of arms are still observed over the doorways of some of the principal houses. C. is surrounded by a strong wall and deep ditch, both of which, however, are in a state of great dilapidation; it has a good but very shallow harbor. C. is the principal mart for Candian commerce, and exports to France and Italy, oil (530 tuns in 1874), soap (50,000 cwts. in 1874), wax, etc. Several consuls are stationed here, and it is the residence of the Turkish governor of the province, and of the Greek bishop. Pop. 12,000, of whom two thirds are native Greeks; the rest mainly Turks. The language spoken is modern Greek. The environs of C. are very beautiful. Sometimes called Candia (q. v.).

CANE-BRAKE, *Arundinaria macrosperma*, a large kind of reed or grass, indigenous to the warmer parts of the United States of North America. It grows in marshy situations. It is of a genus allied to the bamboo. The flowers are in panicles.

CANE DELLA SCALA, 1291–1329; known also as CAN GRANDE, "great dog," a noted prince of Verona, who took Padua from the Guelphs. In 1318, he was appointed to the chief command of the Ghibelline forces, which brought upon him the pope's excommunication. After several victories, he was seized with illness while making a triumphal entry into Treviso, and died in the cathedral of that city. His court was the most important political and social center of the time, entertaining Dante, among other men of learning. In the *Paradiseo*, Dante eulogizes his patron in glowing terms, and Petrarch also sang his praises.

CANEL'LA, *Canella alba*, a small tree common in the West Indies, where it is often called wild cinnamon. Its place in the botanical system has not yet been exactly ascertained, but it seems to be allied to *pittosporaceæ*. The fruit is a small black berry. The whole tree is very aromatic, and its flowers are extremely fragrant. The bark of the young branches is the *C. bark* of apothecaries, also known in commerce as *white-wood bark*, and sometimes called *white cinnamon*. It forms a considerable article of export from the Bahamas. It has an aromatic fragrance, regarded as intermediate between that of cinnamon and that of cloves, and a bitterish, acric, pungent taste. It is employed as a stomachic and stimulant tonic, and as an aromatic addition to tonics or to purgatives, in debilitated conditions of the digestive organs.

CANEPH'ORI, girls of Athens annually selected from the highest families to walk in the Panathenaic and other processions in festivals, carrying on their heads baskets containing the implements and apparatus necessary for a sacrifice. Their graceful attitudes (which may be seen on the friezes of the Parthenon in the British museum) suggested subjects for sculpture to some of the great artists of Greece. Similar statues are also used in architecture to support light entablatures, and are sometimes identified with caryatides.

CANE SUGAR. See SUGAR.

CA'NÉS VENA'TICI (Lat. hunting dogs), a constellation of the northern hemisphere, added by Helvetius, and known generally as the greyhounds of Helvetius. The dogs are distinguished by the names of Asterion and Chara. On the celestial globe, they are represented as being held in leash by Bootes, and apparently pursuing Ursa Major (q.v.) round the pole of the heavens.

CANG, CANQUE, or KEA, an instrument of degrading punishment in use in China. It consists of a large wooden collar fitting close round the neck, and the weight of which is usually from 50 to 60 pounds. Over the parts where the C. fastens are pasted slips of paper, on which the mandarin places his seal, so that the culprit may not be relieved until the full term of his sentence has expired, which sometimes extends to 15 days. On the C. is also inscribed, in large letters, the offense and the duration of the punishment. The criminal having been paraded through the streets by the police, is then left exposed in some thoroughfare of the city. As he is incapable of using his hands, he has to be fed during the time he is suffering the penalty.

CANGA-ARGÜEL'LES, JOSE', 1770–1843; a Spanish statesman who was an active opponent of Napoleon, and an energetic member of the cortes of 1812. On the return of the Bourbons he was exiled to the province of Valencia. Under the restoration of 1820, he was made minister of finance, in which position he made many reforms. After the overthrow of the constitution in 1823 he went to England, but returned to Spain in 1829, and was appointed keeper of the archives at Simancas. He wrote *Elements of Finance;* a *Dictionary of Finance;* and *Observations on the Peninsular War.*

CAN'GAS DE O'NIS, a t. of the Asturias, Spain, about 35 m. e.s.e. of Oviedo. It is a poor place, but in its vicinity are one or two interesting monastic structures, and the cave whence the Goths fled and hid themselves, after the battle of Guadalete, in 711, and from which, in 718, they issued, and annihilated the Moorish invaders. Pop. 7000.

CANGE, Du. See Dufresne, Charles, *ante.*

CANGIA'GI, or CAMBIA'SO, Luigi, 1527–85; a Genoese painter. taught by his father. He gained celebrity at an early age, and, in 1583, was invited to Spain by Philip II. to assist in the decoration of the Escurial, in which he painted the ceiling of the choir, representing the "Assemblage of the Blessed," which is considered his best work. Among others of his works are the "Rape of the Sabine Women," the "Sleeping Cupid," and "Judith."

CANICAT'TI, a t. in Sicily, in the province of Girgenti, and 15 m. e.n.e. of the city of that name. It is situated on the banks of the Naro, is well built, and has sulphur mines. The inhabitants (1872), 20,908 in number, are principally engaged in agricultural pursuits.

CANIC'ULAR, Canicular Days, or Dog-days, Canicular Year. Canicular was an old name of Canis Minor (q.v.); it was also used to denote Sirius, or the dog-star, the largest and brightest of all the stars, and which is situated in the mouth of Canis Major (q.v). From the heliacal rising (q.v.) of this star (Sirius), the ancients reckoned their dog-days, or *dies caniculares,* which were 40 in number—20 before, and 20 after the rising of the star. The rising of the dog-star was in ignorance supposed to be the occasion of the extreme heat and the diseases incidental to these days. It was by mere accident that the rising of the star coincided with the hottest season of the year, in the times and countries of the old astronomers. The time of its rising depends on the latitude of the place, and is later and later every year in all latitudes, owing to precession. In time, the star will rise in the dead of winter. The canicular year was that known among the Egyptians and Ethiopians. It was computed from one rising of Sirius to the next, and consisted ordinarily of 365 days, and every fourth year of 366. This year was sometimes called the heliacal year. The reason for computing the year from the rising of Sirius, seems to have been that, at the time, the heliacal rising coincided with the greatest swelling of the Nile.

CAN'IDÆ (Lat. *canis,* a dog), a family of the digitigrade (q.v.) section of carnivorous mammalia, which, as now generally defined, is less extensive than the Linnæan genus *canis,* the hyenas being excluded from it, and referred to the family *viverridæ* (civets, ichneumons, etc.). Those families are, indeed, closely connected, and hyenas may be said to form a connecting-link between them, the dentition, however, making a nearer approach than in either of them to that of the cats or *felidæ.*—The C. have two flat tuberculous molar teeth or grinders on each side, behind the great carnivorous cheek-tooth—the last premolar—of the upper jaw, a dentition resembling that of the bear family, or *ursidæ,* to which they exhibit a further resemblance in their power of adapting themselves to the use of vegetable food. Their whole organization fits them to be less exclusively carnivorous than the feline tribe. They have generally three incisors or cutting teeth, with one large canine tooth, and four premolars on each side in each jaw, two true molars on each side in the upper jaw, and three in the lower. The true molars are adapted for crushing either bones or vegetable food. The last premolars in the upper jaw are remarkably large, and particularly adapted for cutting flesh. See Dog, Fennec, Fox, Jackal, Lycaon, Wolf, etc.

CANI'NA, Luigi, Cavaliere, 1793–1856; b. in Piedmont; an architect and archæologist. He was professor of architecture at Turin, and superintended the excavation of Tusculum in 1829, and of the Appian Way in 1848. He wrote many works on architecture and archæology, some of which were published in the most sumptuous manner by his patroness, the queen of Sardinia.

CANINES, or Canine Teeth, the four teeth, two in each jaw, which are pointed and stand between the incisors and the bicuspids; sometimes called "eye teeth" or "stomach teeth." In lions, wolves, dogs, and other carnivora they are large and strong, for holding prey and tearing raw flesh.

CANI'NI, Giovanni Agnolo, 1617–66; b. in Rome; a painter and engraver, pupil of Domenicheno and of Barbalvenga. He painted altar-pieces in Rome, among which are the "Martyrdom of St. Stephen," and that of St. Bartholomew. He was engaged by Colbert to design from medals, antique gems, and other sources, portraits of the most illustrious characters of antiquity; but he died soon after the work was begun, leaving the completion to his brother Marcantonio, who, with the assistance of Picard and Valet, published, in 1699, 150 engravings.

CANIS'IUS, Petrus, 1521–97; a Dutch Jesuit, who took a prominent part in the council of Trent in 1545; was preacher to Ferdinand I., and the first ecclesiastical governor of the Jesuits in Germany. He established colleges of the order at Prague, Fribourg, Ausburg, and Dillengen. He was the author of two catechisms, the larger and the smaller, the latter of which has passed through more than a hundred editions.

CA'NIS MA'JOR, the *Greater Dog,* a constellation of the southern hemisphere, below the feet of Orion. It contains Sirius, the brightest of all the stars, and its place may be found by means of this star, which is on the continuation of the line through the belt of Orion. According to Flamsteed, it contains 31 stars.

CA'NIS MI'NOR, the *Lesser Dog*, is a constellation of the southern hemisphere. It is near Canis Major, and just below Gemini. Procyon, of the first magnitude, is its principal star, and lies in a direct line between Sirius and Pollux; so that the position of the constellation may be found by means of this star. According to Flamsteed, it contains in all 14 stars.

CANISTER SHOT. See Case Shot.

CANKER, a disease of plants, especially fatal to fruit-trees in many gardens. It is a kind of gangrene, usually beginning in the young shoots and branches, and gradually proceeding towards the trunk, killing the tree in the course of a few years. Wet subsoils seem in many cases to induce it, and it begins most readily in shoots that have been imperfectly ripened and injured by frost, or which have received some accidental wound. Those varieties of fruit-trees which have been long propagated by grafting and budding are most liable to it. It is sometimes cured by *heading down* the tree, and causing it to throw out new branches.

CANKER, a vague term applied to various diseases of the lower animals, characterized by their chronic nature, and consisting chiefly in ulceration, suppuration, and the development of fungoid excrescences in the parts affected.

CANKER, in the foot of the horse. This malady, believed by Gerlach, of Berlin, to be truly cancerous, is observed in two different forms: in the acute stage, when the malady is chiefly local; and in the chronic stage, when the constitution suffers, and all local remedies fail to restore a healthy function of the structures of the foot.

Symptoms.—It usually commences by discharge from the heels, or the cleft of the frog of the horse's foot. The horn becomes soft and disintegrated, the vascular structures beneath become inflamed, and the pain which the animal endures is intolerable. It is therefore very lame on one, two, or all feet, according to the number affected. Though there is no constitutional fever, the horse becomes emaciated, and unfit for work. During wet weather, and on damp soil, the symptoms increase in severity. The sore structures bleed on the least touch, and considerable fungoid granulations, commonly called proud flesh, form rapidly.

Causes.—This disease is occasionally hereditary, and it is most frequently seen in low-bred draught or coach horses. Dirt, cold, and wet favor the production of the disease, and there is always a tendency to relapse when once an animal has been affected.

Treatment.—Pare away detached portions of horn, and, in mild cases, sprinkle powdered acetate of copper over the sore; apply over this pledgets of tow, fixed over the foot by strips of iron or wood passed between shoe and foot. In severe cases, tar and nitric acid, creosote and turpentine, chloride of zinc paste, and other active caustics, have to be used for a time with the regular employment of pressure on the diseased surface. The animal requires to be treated constitutionally by periodical purgatives and alteratives. Good food, fresh air, and exercise often aid much in the treatment of the disease.

CANKER (*ante*), in the human being, is developed chiefly among children in the form of ulceration of the mucous membrane of the mouth, commonly the result of indigestive derangement. In general it is only a local and temporary affliction, and may be removed by proper application of nitrate of silver, either solid or in a solution, or with borate of soda.

CANKER WORM, *Anisopterys*, a genus of destructive insects of the order *lepidoptera* and family geometridæ. The female moths, from the eggs of which this worm comes, are wingless. In the spring they creep up the trunks of trees, on which they deposit their eggs. These soon produce the worms, which feed upon young leaves of fruit-trees and of nearly all cultivated trees. After about four weeks of feeding they creep down, or let themselves down by a web, and burrow in the ground, where they change to chrysalis, and remain until the following spring. Like other geometridæ, the worm has six legs forward and four stout prop legs behind. In consequence of their singular mode of locomotion they are often called measuring, or inch or span, or loop worms or geometers. As the female moth cannot fly, trees may be protected from this worm by surrounding their trunks with a hollow vessel filled with oil or thin tar, which prevents the ascent of the egg-laying moth; but in recent years the sparrows introduced from England have entirely subdued this worm in many districts that had been completely denuded of leaves almost every summer. This remedy, however, is worse than the disease. The English sparrow is not, in general, an insect-eating, but is a grain-eating bird; it is very pugnacious, and as prolific as the rabbit; it has driven away the native birds wherever it has gained a footing, and as there are many other insect leaf-eaters which it will not touch, and which no other birds are left to destroy, the trees are in nearly as great danger as before, while the grain-fields of farmers are beginning to suffer severely from the ravages of the sparrows.

CANNA, a plant of the order *marantaceæ*, a species of reed, the fruit of which is a hard black seed growing in a capsule. The starch of C. is sometimes used instead of arrow-root. It grows along the coast in the southern states, and is becoming a common ornamental plant in the north.

CANNA, one of the islands of the Hebrides, off the w. coast of Scotland, 7 m. s.w. of Skye, and 3 m. n.w. of Rum. It belongs to Argyleshire, and is 4½ m. long from e. to w., and 1 m. broad. The surface stands high above the sea, and consists of trap (clay-stone, porphyry, and trap conglomerate, with fragments of old red sandstone and bituminous wood), which has overflowed thin laminæ of coal and shale. The island has a hill of basalt, called Compass hill, which reverses the magnetic needle. Pop. '71, 48.

CANNABINA'CEÆ, a natural order of dicotyledonous plants, or, according to many, a suborder of URTICACEÆ (q.v.), differing from the proper *urticaceæ* chiefly in the suspended exalbuminous seed, and hooked or spiral embryo. But only two plants of the order or suborder are known, both of them valuable, HEMP (q.v.) and the HOP (q.v.).

CAN'NABIS IN'DICA. See HEMP, *ante.*

CAN'NÉ (ancient *Cannæ*), a t. of Southern Italy, in the province of Bari, 8 m. w.s.w. of Barletta, not far from the mouth of the Ofanto, formerly the Aufidus. It is celebrated on account of the great victory here gained by Hannibal over the Romans in the summer of 216 B.C. Hannibal crossed the Aufidus at a ford, and attacked the Romans, who in a short time were almost annihilated by the terrible Numidian cavalry. Among those left on the field were Paulus Æmilius, the consul of the previous year; Minucius, the late master of the horse; and a vast number of Roman knights. The loss of the Romans is stated by Livy at 45,000 infantry and 3,000 cavalry. As Hannibal lost in the battle 8,000 men, he did not think it prudent to follow the advice of Maharbal, and advance rapidly on Rome. Twenty thousand Romans were made prisoners, partly on the field of battle and partly in the camp.

CANNEL COAL. See COAL, *ante.*

CANNELTON, a t. in Perry co., Ind., 70 m. above Evansville; pop. '80, 1,834. Near the town are the most extensive coal mines below Pittsburg. Fire-clay, sandstone, and limestone are also abundant. There is a large cotton mill in the village.

CANNES, a seaport t. of France, in the department of Alpes-Maritimes, pleasantly situated on the Mediterranean, on the road to Nice. It is famed for its salubrity, which has induced a number of English families to make it a winter residence. Lord Brougham used to occupy a fine villa here. Latterly, the town has been much improved. It has fisheries of anchovies and sardines, and a trade in the produce of the district. After his escape from Elba, Bonaparte landed about a mile and a half to the e. of C., Mar. 1, 1815. Pop. '76, 13,519.

CANNIBAL (derived from a variety in the spelling of Caribs, the original inhabitants of the West India islands, who were reputed to be man-eaters, and some tribes of whom, having no *r* in their language, pronounced their name *Canib*), means, like the Greek word *anthropophagos,* which is often used instead of it, one who feeds on human flesh. The practice is often attributed by classical and early Christian writers to races whose practices they denounce as abominable; but the denunciation is often better evidence of the abhorrence of cannibalism by those making the accusation than of its practice by the accused. Homer makes Polyphemus eat men, but only as one of his other unnatural attributes as a monster. The early Christian writers frequently attributed cannibalism to the unconverted. St. Jerome gives his personal testimony to the practice, stating that when he was a little boy living in Gaul he beheld the Scots—a people of Britain—eating human flesh; and though there were plenty of cattle and sheep at their disposal, yet would they prefer a ham of the herdsman or a piece of female breast as a luxury. Statements in old authors still more absurd induced some thinkers to believe that cannibalism is unnatural, and to deny that it was ever practiced by human beings expect under the pressure of starvation. The accurate observation of late travelers has, however, put it beyond doubt that cannibalism has been and is systematically practiced. Comte, as part of his system of positive philosophy, accepting of cannibalism as a condition of barbarism, maintains that the greatest step in human civilization was the invention of slavery, since it put an end to the victor eating the vanquished. The facts, however, which we possess, show that the people systematically addicted to human flesh are not the most degraded of the human race. For instance, in the Australian continent, where the larger animals are scarce, the people, who are of an extremely degraded type, feed on worms and herbs, and have only been known in casual and exceptional conditions to feed on human flesh. The New Zealanders, on the other hand, who are the most highly developed aboriginal race with which late European civilization has had to compete, were, down to a late period, systematic feeders on human flesh, despising the inefficient food which satisfied the natives of Australia. In Angas's *New Zealand Illustrated,* there is a picture of the country mansion of the accomplished chief Rangihaeta, "one of the finest specimens," says the author, "of elaborately ornamented dwellings yet extant." Its name is Kai Tangata, which means, eat man; and it has been so called in pleasing memorial of the feasts held within its walls. It has been supposed that the reason why, among the Jews and several eastern nations, the eating of swine's flesh was forbidden as an unclean food, was its resemblance to human flesh, and the danger that persons accustomed to the one might not retain their abhorrence of the other. In the crusades, the Saracens charged their Christian enemies with eating unclean food, including flesh

of men and of swine. In the old romance of Richard cœur de lion, he is represented, on recovering from sickness, as longing for a piece of pork; but that not being procurable, a piece of a Saracen's head was substituted for it, and pronounced by him to be infinitely more palatable. There have been many sad instances where people who naturally had a horror of such food, have been driven by starvation to eat human flesh —as in sieges and shipwrecks. Besides these instances, however, and the systematic cannibals, there is no doubt that people not otherwise habituated to the practice, have been excited by ferocity and revenge to eat, and with relish, the flesh of enemies. In many of the cannibal countries, only the flesh of enemies is consumed. As an instance that this is a natural development of ferocity in degraded natures, we may take the fate of the princess Lamballe in the French revolution, whose heart was plucked out by one of the savages of the mob, taken to a restaurant, and there cooked and eaten by him. The great Highland chief, sir Ewen Cameron of Locheil, in a death-struggle with an English trooper, killed him by biting a piece out of his throat, and used to say it was the sweetest morsel he had ever tasted.

CANNING, Charles John, Viscount, second son of the statesman George, was b. Dec., 1812. Educated at Eton and Oxford, he succeeded to the peerage as viscount C. on his mother's death in 1837, his elder brother, who was a captain in the navy, having been drowned at Madeira in 1828. In 1841, he became under-secretary of state for foreign affairs in sir Robert Peel's government, and afterwards commissioner of woods and forests. When lord Aberdeen came into office, he was made postmaster-general; and in the beginning of 1856, he succeeded lord Dalhousie as governor-general of India. His conduct during the awful crisis of the Indian mutiny was decried at the time by many as weak and pusillanimous; but the general opinion now, when all the circumstances of the case are better known, is that he acted with singular courage, moderation, and judiciousness. He died in London, 17th June, 1862.

CANNING, George, a distinguished British statesman and orator, was b. in London, April 11, 1770. His father, who was descended from an ancient family, incurred the displeasure of his relatives for marrying beneath his station, and died in poverty when his son was only a year old. His mother (who for a subsistence tried the stage, with but little success, married an actor, and subsequently a linen-draper) lived to rejoice in the success and participate in the good-fortune of her boy, whose education was liberally provided by an uncle. C. was first educated at Eton, from which he passed, at the age of 17, to Christ's church college, Oxford, where he greatly distinguished himself, especially in classics. While here, he cultivated the friendship of the Hon. Charles Jenkinson (afterwards lord Liverpool), who was of considerable service to him in after-life. From Oxford he went to Lincoln's inn, but on the suggestion of Burke, as it is said, he soon relinquished the bar for a parliamentary career. He entered the house for Newport, Isle of Wight, in 1793, as the protégé and supporter of the minister, Pitt. In 1796, he was appointed an under-secretary of state. It was not, however, until 1798 that C. made a reputation as an orator and a statesman, by his speeches in favor of the abolition of the slave-trade, and against Mr. Tierney's motion regarding peace with the French directory, the latter of which, especially, was regarded as a masterpiece of eloquence, alike by the house and the country. In the debates on the habeas corpus suspension act, the union with Ireland, and other important questions, C. gave valuable assistance to the ministry, not only by his voice in parliament, but by his pen in a satirical paper, called the *Anti-Jacobin*, in which he especially lashed the "new philosophy," as it was called, promulgated by the French republicans. *The Knife Grinder* is one of the best known and happiest of his efforts in this line. In 1801, Pitt resigned office, and C. joined the opposition against the Addington ministry. When Pitt again became premier in 1804, C. was made treasurer of the navy, an office which he held until Pitt's death in 1806. His opposition to the short-lived Grenville ministry which succeeded, savored of the bitterness of party feeling, and his treatment of Fox in his last days, and of his memory after his death, was far from generous. When the Portland ministry was formed in 1807, C. was appointed minister for foreign affairs, a position for which he was specially qualified, and his dispatches, written at this time, are models of manliness and lucidity. In 1812, all his eloquence was enlisted in favor of Catholic emancipation. During the same year he was elected for Liverpool, for which he was again returned three successive times. In 1814, he went as ambassador to Lisbon, returned in 1816, and was made president of the board of control, and supported the Liverpool ministry in all their arbitrary and repressive measures until 1820, when he resigned, in consequence of the action of the government against queen Caroline. Nominated governor-general of India in 1822, he was on the eve of departure when the suicide of the marquis of Londonderry called him to the head of foreign affairs. In this capacity, C. conferred lasting benefits on his country. He infused a more liberal spirit into the cabinet, he asserted the independence of British politics against the diplomacy that would have entangled the nation with the Holy Alliance, and gave a new direction and impetus to commercial affairs by a gradual laying aside of the prohibitive system. He arranged the relations of Brazil and Portugal; drew the French cabinet into agreement with the British respecting Spanish American affairs; was the first to recognize the free states of Spanish America; promoted the treaty combining England, France, and Russia, for a settlement of the affairs of Greece,

and which was signed July 6, 1827; protected Portugal from Spanish invasion; contended earnestly for Catholic emancipation; and prepared the way for a repeal of the corn-laws. In Feb., 1827, a stroke of paralysis forced the earl of Liverpool to resign, and Mr. C. was called upon to form a new administration. His health, however, gave way under the cares of office, and he died 8th Aug. of the same year. His remains were interred in Westminster abbey, near those of Pitt. As a parliamentary orator, C. holds a prominent place in British annals. His acuteness of mind, power of expression, and well-pointed wit, were remarkable; but, on the whole, he was inferior to Pitt, Burke, and Fox. He lacked the imposing characteristics of the first, the overpowering enthusiasm of the second, and the winning address of the last. He was intensely British, and his foreign policy was of the character best calculated to promote British interests.

His speeches have been reprinted in 6 vols. 8vo, by Therry, and several memoirs, including one by his private secretary, Mr. Stapleton, have been published.

CANNING, Sir STRATFORD. See STRATFORD DE REDCLIFFE, Viscount.

CANNON is a general name for large pieces of ordnance or artillery, as distinguished from those pieces which can be held in the hand while being fired. No military weapon in use before the invention of gunpowder can fairly come under this designation; they were more generally of the kinds described under BALISTA. At what exact date C. were first used is not known; but C., called "crakys of war," were employed by Edward III. against the Scots in 1327, by the French at the siege of Puy Guillaume in 1338, and by Edward III. at Crecy, and at Calais in 1346. The first C. or *bombards* were clumsy, wider at the mouth than at the chamber, and made of iron bars hooped together with iron rings. The balls fired from them were first made of stone, afterwards superseded by iron. In the 15th c., various kinds were known by the names of C., bombards, culverins, serpentines, etc. Bombards of great length and power were employed by Louis XI. during his Flemish campaign in 1477, some with stone balls, some with iron. About this time, C. began to be made by casting instead of with hooped bars; and bronze or brass as a material began to be used as well as iron. The C. of the 16th c. were generally smaller, but better finished, than those of the 15th. The largest C. made in the 17th c., so far as is known, was the Bejapoor cast-iron gun, "Malick é Meidan," or "Lord of the Plain," made either by Aurungzebe or by the Mahrattas; it was 14 ft. long, 28 in. bore, and required a ball of 1600 lbs. weight. From the time of the great European wars in that century, C. have undergone vast improvements, as well as the science and art of artillery necessary for their management. Major Straith, a leading authority on this matter, gives the following tabular view of the chief kinds of ordnance in use in the British service, prior to the introduction of rifled guns:

Kind.	Name.	Caliber. Inch.	Length. Ft.	Length. Inch.	Weight. Cwt.
Iron shell guns	12 inch	12	8	4	90
	10 "	10	9	4	84
	8 "	8	8	9	60
Long iron guns	32-pounders	6.4	9	5	56
	24 "	5.8	9	0	47
	18 "	5.3	9	0	42
	12 "	4.6	9	0	33
	9 "	4.2	8	6	28
Long brass guns	12 " (medium)	4.6	6	7	18
	9 "	4.2	6	0	13
	6 " (heavy)	3.7	8	6	23
	6 " (light)	3.7	5	0	6
	3 " (colonial)	2.9	4	0	3
	1 " "	2.0	5	0	2
Iron howitzers	10 inch	10.0	5	0	40
	8 "	8.0	4	0	20
Brass howitzers	32-pounders	6.3	5	3	17
	24 "	5.0	4	9	12
	12 "	4.6	3	9	6
Iron carronades	68 "	8.0	5	2	29
	42 "	6.8	4	4	22
	32 "	6.2	4	0	17
	24 "	5.7	3	9	13
	18 "	5.2	3	3	10
	12 "	4.5	2	8	6
Iron mortars	13 inch	13.0	3	1	36
	10 "	10.0	2	4	16
	8 "	8.0	1	11	8
Brass mortars	$5\frac{1}{2}$ "	5.5	1	3	150 lbs
	$4\frac{2}{5}$ "	4.6	1	0	104 lbs

It must be borne in mind, however, that many of the novelties introduced within the last few years are not here included. Nevertheless the table will be useful for occasional reference. The apparent inconsistencies in length and weight are due to the

great differences in thickness of metal; and if we were to go beyond the limits of the table, we should find that, during half a century, iron 32-pounders have varied from 63 down to so low as 25 cwt., and 24-pounders from 50 to 33 cwt.; in each case the length and weight varying, while the caliber remained constant. In the above table, the caliber is not always precisely the same for the same weight of ball; as instanced by the 32-pounders, which have 6.2, 6.3, and 6.4 in. caliber; this is due to the fact that some guns have more *windage*, or space round the ball, than others.

In England, during the last few years, great expense has been incurred in replacing old C. by others of larger power and caliber; while the French are gradually bringing about a limitation in the number of kinds and sizes, for the sake of simplicity.

This being merely a general or collective notice of all kinds of C. as a class, particulars concerning each kind will be found under such headings as ARMSTRONG GUN, CARRONADE, GUN, HOWITZER, LANCASTER GUN, MORTAR, SHELL GUN, etc.

CANNON, ALLOYS FOR. The material formerly used for the manufacture of ordnance was bronze (q.v.), consisting of about 90 parts of copper to about 10 parts of tin. In the casting of small C., such as 8-pounders, the alloy used contained 92½ parts of copper to 7½ parts of tin; while in the larger C. the tin was increased until the proportion reached 88 to 12. The presence of the tin increased the hardness of the alloy, but this was obtained at the expense of the tenacity. Great care must be taken to insure the purity of the copper and the tin. If lead is present, the alloy is always more or less soft, and, moreover, liable to fuse after repeated explosions; while the presence of a mere trace of sulphur, arsenic, phosphorus, etc., renders the alloy very brittle. It was customary, in the casting of C., to use up old C. or other bronze implements, so as to form a beginning of the fused metal in the furnace, and then to add little by little the extra amount of copper and tin. This mode of procedure was followed, owing to the difficulty found in getting copper and tin to amalgamate readily, so as to yield an alloy of uniform composition. This point is of great importance in the casting of ordnance, as the metals, when not properly alloyed, are liable to separate during cooling, and yield a C. of variable composition throughout. With the exception of small steel mountain guns, all British cannon are made of wrought iron.

CANNON, a co. in central Tennessee; 220 sq.m.; pop.'80, 11,859—1163 colored. The surface is uneven, but the soil is generally fertile, producing grain, tobacco, etc. Co. seat, Woodbury.

CANNON, GEORGE Q. See page 888.

CANNON, JOSEPH G. See page 888.

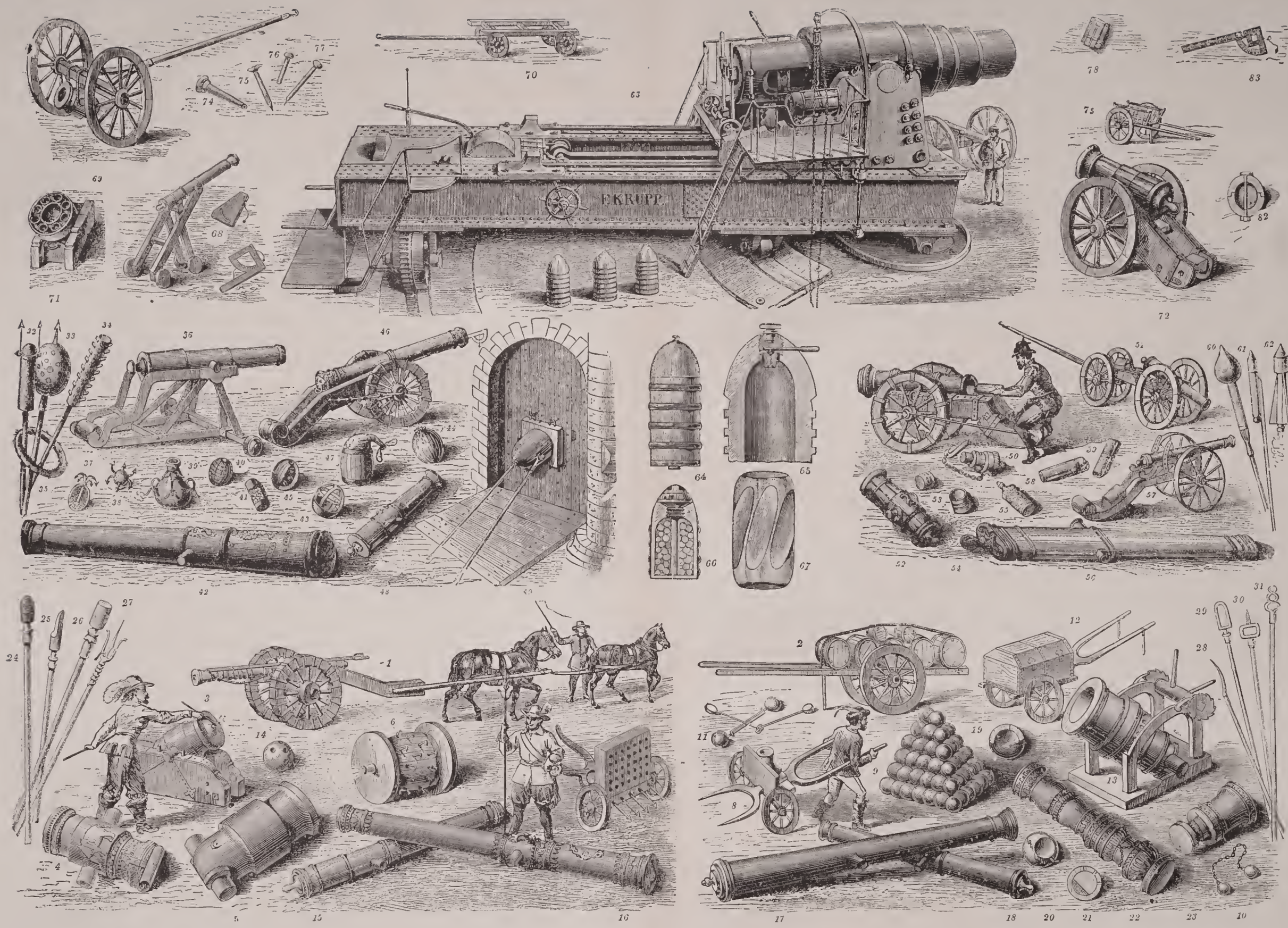
CAN'NON-BALL TREE, *Couroupita Guianensis*, a tree of the natural order *lecythidaceæ*, a native of Guiana, of great size, the trunk being often more than 2 ft. in diameter. It has large ovate-oblong leaves; the flowers are produced in racemes, they are white and rose-colored; and the fruit is large, "about the size of a 36-pound shot," nearly round. The hard woody shell of this fruit is used for drinking-vessels.

CANNON FOUNDING. Since sir W. Armstrong succeeded, by a process first brought under the notice of the British government in 1854, in making of malleable iron a field-gun of far greater efficiency than any previously in use, cannon founding has in most European countries gradually ceased. This manufacture, which was formerly an important one, is, however, still carried on in the United States, Sweden, and Russia, all three of which countries produce cast-iron of a very superior quality.

Cannon are cast in molds of loam or sand prepared with the help of a pattern, as described under FOUNDING. They are usually cast vertically with an extra mass of metal poured in at the top end of each mold to secure by its pressure greater solidity in its walls, as is often done in the case of a hydraulic cylinder. This superfluous portion is, of course, afterwards removed. Cannon are, or at least were, often cast solid with the same object, and afterwards bored, although it is by no means certain that such are generally sounder or of closer texture than those which are cast hollow. In either case the inner surface of the cannon is accurately finished with a boring tool to the required calibre, and the outer surface turned. Brass, or rather bronze cannon, were usually cast in loam by means of a clay model on which were often stuck ornamental figures in wax, these being melted out of the mold before casting.

In the United States, cast-iron guns are made by Rodman's process; that is, they are cast hollow on a core barrel which is filled with water. This is applied so as to cool the metal of the gun in layers, thus modifying the initial strain upon it, and producing the best result that can be obtained from cast-iron for ordnance purposes. Within the last few years guns as large in the bore as 20 in. have been cast by this method at Pittsburg, and one of the same size has been made by it in Russia. The latter weighs 44 tons, throws a spherical ball of 9 cwt., and took 3½ months to finish. Its cost was not more than one fourth that of a built-up gun of steel for the same weight of projectile.

Many of the earlier pieces of ordnance, it is curious to observe, were made of hooped bars, in which one can trace the germ of the process by which the Armstrong gun is made. Indeed, it is doubtful if any modern plan of constructing large guns was not tried in olden times, as is seen by an examination of the different kinds of old cannon still preserved. These, however, had to be constructed without the aid of the steam-hammer and other appliances, which render such work comparatively easy nowadays, and were accordingly deficient in strength. The earlier wrought-iron cannon were eventually superseded by those made of cast-iron and bronze, but not entirely for some considerable time after the latter had been in use.



CANNON, ETC, *Antique*.—1. French six-pound false culverin (1550). 2. French ammunition cart (1560). 3. French twenty-pound mortar. 4. German eighteen-pound mortar (the "Elephant," 1565). 5. German twenty-five pound mortar (1800). 6. Storming-key (1680). 7. German fire-shield (1620). 8. German battle-chariot (1620). 9. Pile of balls. 10, 11. Chain and stem-shot. 12. Danish cartridge-carriage (1720). 13. German twenty-pound mortar with carriage. 14. Fire-bomb. 15. German sectional shield-piece (1680). 16. German twenty-pound culverin (1550). 17. French culverin (1550). 18. German falconet (1740). 19-21. Concentric, eccentric and explosive bombs. 22. Italian bombarde (1500). 23. Italian mortaro (1500). 24. Sponge. 25. Loading-shovel. 26. Rammer. 27. Fuse. 28. Spike. 29. Swipe. 30. Charge-drawer. 31. Ball-extractor. 32. Double-barbed spear. 33. Storming spear. 34. Storming club. 35. Storming wreath. 36. Danish iron gun carriage for forts (1713). 37. Hot-shot with anchor. 38. Anchor-ball. 39. Fire-jug. 40. Fire-ball. 41. Gun-cartridge. 42. Forty-pound cannon of Charles V. 43. Fire-cross. 44. Fire-ball. 45. Explosive-ball. 46. German twelve-pound field-piece. 47. Powder-barrel. 48. Prussian twelve-pound field-piece (1812). 49. Petard. 50. German breech-loader (1550) 51. French field-piece (1750). 52. Prussian ten-pound howitzer (1812). 53. Cartridge. 54. Wad. 55. Bag-cartridge. 56. German cannon with oval lumen (1680). 57. Danish three-pound field-piece, with cast-iron carriage (1713). 58. Ball-cartridge. 59. Shot-cartridge. 60. Prussian petard-rocket. 61. Rocket with side-staff. 62. Rocket without staff. 63. Krupp 1000-pound gun. 64, 65. Percussion shells. 66. Prussian shrapnell-shell. 67. Whitworth's shell. 68. French mountain-piece (1680), and quadrants. 69. Drag. 70. Block-chassis. 71. French mortar with side-chambers (1680). 72. Prussian twenty-five pound howitzer. 73. Wooden mould for fire-balls. 74. Fusee. 75-77. Tin fusees. 78. French brake (1818). 79. Trangree cart. 80. Quadrant.

The mortar, which was introduced about the commencement of the 14th c., appears to have been not only the most ancient form of cannon, but the first European fire-arm as well. From the beginning of the 15th c., cannon were cast in bronze, and some of great size are stated to have been used at the siege of Constantinople in 1463. Probably hand cannon of cast-iron date as far back as bronze guns, and at any rate we know that large and excellent cannon were made of cast-iron in the early part of the 16th c., they having been used at Flodden, and England having even then acquired a reputation for this kind of ordnance. See FIRE-ARMS. Cannon founding has therefore been practiced for nearly 500 years, and although the art is now to all appearance doomed to decay, no one can predict, in these days of metallurgical wonders, what further change improvements in the manufacture of iron and steel may bring about as respects the making of large fire-arms. In order that the cast guns made on the old system may still be available for some purposes in modern warfare, col. Hay Campbell, some years ago, proposed a plan for lining bronze, and sir W. Palliser another for lining cast-iron cannon with a tube of wrought-iron. Some have been transformed on the Palliser system, which consists in boring a certain thickness off the old gun, and forcing a coiled wrought-iron barrel into the interior, and are said to have given very remarkable results as regards endurance.

Certain peculiarities in the manufacture of special kinds of ordnance are noticed in the articles relating to them. See WAR-SERVICES.

CANNONSBURG. See CANONSBURG.

CANNSTADT, a t. of Würtemberg, beautifully situated on the Neckar, about 3 m. n.e. of Stuttgart. It owes its origin to the Romans, of whose presence there are still found many traces. It has numerous mineral springs, discharging 800,000 cubic ft. of water in 24 hours, which are much frequented during the season; manufactures of woolens, cottons, tobacco, etc.; and a large trade by means of the Neckar. Pop. ('75) 15,065.

CANNSTADT, or KANNSTADT (*ante*), a t. in Wurtemberg, 2½ m. n.e. of Stuttgart, in a fertile and populous part of the country, and now one of the most flourishing towns in Germany. Among its public buildings are a cathedral of the 15th c., a town hall, the royal theater, market house, etc. The Wilhelm palace, built in 1842–51, for king William, is a fine specimen of elaborate Saracenic architecture. The more important industries are spinning, cotton-weaving, dyeing, and the manufacture of machinery. The mineral springs, about 40 in number, attract a large temporary population of those who suffer from dyspepsia and nervous weakness. In the hill of Seilberg, near by, are caverns in which many fossils are preserved. Down to the middle of the 15th c., C. was the capital of Wurtemberg. Pop. '80, 16,020.

CA'NO, ALONSO, an illustrious Spanish painter, the founder of the school of Granada, in which city he was born, Mar., 1601. He received his first instructions in the principles of art from his father, Miguel Cano, who was an architect; studied sculpture under J. Montanes, and painting under Pacheco and Juan de Castillo; and attained celebrity so early, that, in 1638 or 1639, he was appointed court painter and architect to the king. C. was of a hasty temper, and was accused of having murdered his wife in a fit of violent jealousy, but the accusation appears to have been quite groundless. He was, however, subjected to the torture; but no confession having been elicited, he was acquitted and received again into the royal favor, named residentiary of Granada, and spent his last years in acts of devotion and charity. He died at Granada in 1664 or 1667. In the opinion of Fuseli, he excelled all his contemporaries except Velasquez. His eminence in the three departments of the fine arts—sculpture, painting, and architecture—obtained for him the hyperbolical honor of being called the *Michael Angelo* of Spain. His pictures, marked by graceful design and pleasing coloring, are very numerous, and are preserved in Granada, Seville, Madrid, Malaga, and other Spanish cities.

CANO, ALONZO, 1601–65: a Spanish painter, called by his countrymen the "Michael Angelo of Spain." His master-piece is said to be the "Conception of the Virgin" in the church of San Diego, in Granada. He was a contemporary of Velasquez, and was court painter to Philip IV. He was a man of violent temper, and was once tried (but acquitted) on a charge of having killed his wife, when the judges who put him to torture, exempted his right arm from the rack, because of its surpassing skill in art. In statuary his famous works are a Madonna and Child, and colossal figures of San Pedro and San Pablo.

CANO, or CANUS, MELCHIOR, 1523–60; a Spanish theologian and bishop, professor at Salamanca. By reason of his violent opposition to the establishment of the Jesuits in Spain, he was sent to the Canaries, but by the king's influence, was soon afterwards permitted to return, and became provincial of the Dominican order.

CANOE' * is a boat made of a hollow trunk of a tree, or of the bark shaped and

* The word is sometimes said to have been borrowed by the Spaniards from the native Indian name of such boats. But a similar name exists in the Aryan languages: Ger. *kahn*, a boat; old Fr. *cane*, a ship, and *canot*, a boat. The root of these words is the same as that of *cane* (Lat. *canna*), a reed or hollow stem, and signifies hollowness, capacity; Gr. *chaino*, to gape or *yawn*. From the same root come *cann*, a drinking cup; *cannon* (Ital. *cannone*, properly a large tube, being an augmentative from *canna*, a hollow stem or tube); *canon* (Gr.) a ruler or straight rod, most readily obtained from a joint of a reed; *canal* (Lat. *canalis*, a pipe or conduit).

strengthened. Canoes have been made large enough to carry twenty or thirty hogsheads of sugar. Some have decks, and carry sail of rush or silk-grass; but they are generally open boats, rowed by paddles, and steered by an oar. They are seldom wide enough for two men to sit abreast, but vary greatly in length. Near sea-coasts, canoes are often made of light wooden-frames, covered with seal-skins, which are also drawn across as a deck, with only a hole left for one man to sit in. In the Hudson Bay territories, canoes are used which are light enough to be carried over the *portages*, or portions of rivers too shallow for navigation. Canoes, hollowed out of the trunks of oaks, seem to have been in use among the early inhabitants of the British islands. They have been dug up in considerable numbers in England, Scotland, and Ireland. They appear to have been chiefly of two sorts—one about 10 ft. long, with square ends, and projecting handles; the other, about 20 ft. long, sometimes sharp at both ends, sometimes round at the prow and square at the stern.

CANON, a word originally Greek, and signifying a measuring-rod (see CANOE—footnote), applied in various arts and sciences to what serves for a rule or standard, but particularly employed to designate collectively those books which constitute the Holy Scripture, and are accepted by Christians as a rule of faith. See BIBLE. In ecclesiastical language, the word *canon* signifies, besides, not only a church-precept, but also the decree of a universal council, which is held valid as law. See CANON LAW. At one period the word was used to designate the prayers which the Roman Catholic priests said before, at, and after the consecration of the Host; the term is also employed to denote the catalogue or register of Catholic saints.

CANON, an ecclesiastical dignitary, so called as living under a rule, or as following the rule or canon of divine service. His office is of no great antiquity. According to Paschier, the name was not known before Charlemagne. This, however, is not precisely true, for the term C. was applied in the 4th c. to cenobites living under a common rule; but the office of C. is supposed to have been first instituted by Chrodegand or Chrodegang, bishop of Metz, in 763. It is at least certain that he was the author of the oldest canonical rule, which was simply an adaptation of the monastic rule (commonly but erroneously attributed to St. Augustine) to the priests and "clerks" specially attached to the service of a cathedral or other church. It enjoined on the canons manual labor, the practice of silence at certain times, confession twice a year, and other duties needless to specify. The canons formed the council of the bishop, and assisted him in the government of his diocese. They lived in a house called a *monastery*, slept in a common room, ate at the same table, and were originally supported out of the episcopal revenues. In 816, Louis le Débonnaire induced the council of Aix-la-Chapelle to draw up a general rule for the whole body of canons. Canons found their way not long afterwards into England, Scotland, and Ireland. Various reforms of C. were made in the 11th and beginning of the 12th century. Gradually, however, many began to emancipate themselves from the restrictions of monastic life, and to live independent of any rule, which is not at all surprising, for the canons were wont to keep apart from the "lower clergy," as they called parish priests and others who really labored to impart religious instruction. They were often of noble families, loved titles—at Lyon, they were called *counts*—and in general were men of the world rather than true churchmen. Some of these reformed or remodeled canons were called black canons, from wearing a black cassock; white canons, from wearing a white habit like the *Præmonstratenses* of Picardy in France. The class of *secular* canons, whose manner of life was not conventual, and who therefore escaped destruction in England when the monasteries were abolished by Henry VIII., probably originated in a tendency to relax the severity of rule enjoined on the regulars, which indeed was hardly less stringent than in the case of ordinary monks. Secular canons still exist in the Anglican church, and their duties—making allowance for the difference between the Roman Catholic and Protestant religions—are much the same in kind as they were before the reformation. See CATHEDRAL.

CANON, in music, a kind of fugue in which not merely a certain period or phrase is to be imitated or answered, but the whole of the first part with which the C. begins is imitated throughout by all the other parts. As in fugues, the melody of the part to be imitated is called the subject, and the others its reply. The C. is the highest degree of mechanical musical contrivance. The ancients spent more time in the construction and resolving of mere puzzling and unentertaining canons, than in the cultivation of good harmony and melody. Good canons, however, are alway interesting, and different from any other composition. For a full treatment of the method of writing a C., see Marpurg's *Abhandlung von der Fuge* (Peters, Leipsic).

CAÑON (Sp. a "tube"), used in the western states and territories to designate a deep ravine, especially if worn down by running streams. Of late the word is often spelled *canyon*. There are many cañons in the Rocky mountain region and further westward; but the greatest is the Grand Cañon of the Colorado, which is more than 300 m. long, with nearly perpendicular walls from 3,000 to 7,000 ft. high. Through this awful gorge the river flows, now down swift declines, now in peaceful pools, or long stretches of navigable water.

CAÑON CITY, in Fremont co., Colorado, on the Arkansas river at the foot of the Rocky mountains, and on the Denver and Rio Grande railroad. There is unlimited water-power, and in the neighborhood are iron, silver, copper, coal, petroleum, marble, and limestone. There are also hot and cold medicinal springs.

CANONESS, the name given to female members of certain orders in the Roman Catholic church, who seldom took monastic vows, but lived in common. The communities were favored by noblemen, who intrusted their daughters to them, but with the privilege to marry at any time. After the reformation, there were Protestant houses of similar kind in Mecklenburg and Westphalia.

CANON'ICAL HOURS, are the times fixed for divine service in the Catholic church, but no longer strictly adhered to. These have not always been the same, and it is not known when nor by whom they were settled—some say by popes Damasus, or Gelasius, or Gregory—but they are now fixed at seven; viz., matins and lauds, prime, tierce, sext, nones, vespers, and compline. These used to be observed as follows: Prime, tierce, sext, and nones, at the first, third, sixth, and ninth hours of the day, counting from six in the morning; vespers at the eleventh hour; compline, or completorium, as completing the services of the day, at midnight; and matins shortly after midnight. These hours were by the Anglo-Saxons called uhtsang, primesang, undersang, middaysang, noonsang, evensang, and nightsang. The firs, two and the last formed the nocturnal, the remaining four the diurnal offices. The reasons given for the dividing the day into seven parts were—that in seven days the creation was completed, that seven times a day the just man falls, there are seven graces of the Holy Spirit, seven divisions of the Lord's prayer, seven ages of a man's life, etc. The hours had also each its mystical reference to certain sacred occurrences, such as the incidents at our Lord's birth and crucifixon. The word "hour," in C. H., is derived, as some have suggested, from *ora*, a prayer; but more probably from *hora*, an hour, and called canonical because according to the canon or rule of the church. The proper offices for the C. H. are to be found in the Breviary (q.v.).

CANONICALS, a term used to describe the proper ecclesiastical dress of the clergy. See VESTMENTS.

CANON'ICAL VIRGINS, young women of the early church who took vows of perpetual virginity, but were not gathered into communities. They were inrolled at their homes, where they continued to reside.

CANON'ICUS, a Narragansett Indian chief, 1565–1647; the constant friend of the early white colonists, and especially of Roger Williams, to whom he was strongly attached. It was from him that Williams obtained his title to the lands that now constitute Rhode Island.

CANON'ICUT, or CONANICUT, an island in Narragansett bay, about 8 m. long by 1 wide. It forms the town of Jamestown, R. I.; pop. '80, 459.

CANONIZATION, in the church of Rome, the act of the pope by which a deceased person is solemnly declared to be a saint. It had its origin in the practice of the early church, of inserting in the commemorative prayer of the eucharistic liturgy the roll of the names of those who had died as martyrs, or distinguished themselves as confessors of the faith. This record was entered in the diptychs of the church, and read in the so-called "canon" of the liturgy. Each bishop was at first accustomed to declare deceased persons to be saints. In the west, the exercise of this power came to be reserved to the popes, and the ceremonial itself was invested with much solemnity, and regarded as of very great importance. The first papal C. was accomplished by John XV. The popes have possessed the exclusive right since 1170. The right of *beatification* (q.v.) also belongs to them. When it is proposed to canonize a person of reputed sanctity, the pope declares his views in a consistory, and an inquiry is instituted as to the virtues and merits of the person proposed. The form of inquiry is that of a regular process at law, and an ecclesiastic is specially appointed to contend against the claims advanced, who receives the designation of *advocatus diaboli;* and on failure of satisfactory proof, the process is abandoned. When a favorable decision is pronounced, the ceremony of C. is performed in St. Peter's church with great pomp. The last C. was in 1862.

The Greek church also recognizes *canonization.* The right to perform the ceremony ies with the patriarch of Constantinople, but it has rarely occurred. An analogy to Christian canonization has been found in the apotheosis (q.x.) of the ancient Romans.

CANON LAW is a collection of ecclesiastical constitutions for the government and regulation of the Roman Catholic church, although many of its regulations have been admitted into the ecclesiastical system of the church of England, and still influence other Protestant bodies. It was compiled from the opinions of the ancient Latin fathers, the decrees of general councils, and the decretal epistles and bulls of the holy see. These, from a state of disorder and confusion, were gradually reduced into method, and may be briefly described in the following chronological order: 1. *Gratian's Decree,* which was a collection of ordinances, in three books, commenced by Ivo, bishop of Chartres, 1114 A.D., and subsequently corrected and arranged by Gratian, a Benedictine monk, in the year 1150, after the manner of Justinian's *Pandects of the Roman Law*

This work comprises ecclesiastical legislation, as it may be called, from the time of Constantine the great, at the beginning of the 4th, to that of pope Alexander III., at the end of the 12th century. 2. The *Decretals.* They are a collection of canonical epistles, in five books, written by popes alone, or assisted by some cardinals, to determine any controversy, and first published about the year 1230, by Raimundus Barcinus. They lay down rules respecting the lives and conversation of the clergy, matrimony and divorces, inquisition of criminal matters, purgation, penance, excommunication, and other matters deemed to be within the cognizance of the ecclesiastical courts. To these five books of Gregory, Boniface VIII. added a sixth, published 1298 A.D., called *Sextus Decretalium,* or the *Sext,* which is itself divided into five books, and forms a supplement to the work of Barcinus, of which it follows the arrangement. The *Sext* consists of decisions promulgated after the pontificate of Gregory IX. Then there came the *Clementines,* which were constitutions of pope Clement V., published 1308 A.D. These decretals form the principal portion of the canon law. John Andreas, a celebrated canonist in the 14th c., wrote a commentary on them, which he entitled *Novellæ,* from a very beautiful daughter he had of that name, whom he bred a scholar; the father being a professor of law at Bologna, had instructed his daughter so well in it, that she assisted him in reading lectures to his scholars, and therefore, to perpetuate her memory, he gave that book the title of *Novellæ.* 3. The *Extravagants* of John XXII. and other later popes, by which term is meant to be denoted documents which transcend the limits of a particular collection of regulations. These books, viz., *Gratian's Decree,* the *Decretals,* and the *Extravagants,* together form the *Corpus Juris Canonici,* or great body of the C. L., as formerly received and administered by the church of Rome. There are, however, other publications of a later period, of more or less authority, but which do not appear to have received the formal sanction of the holy see.

This C. L., borrowing from the Roman civil law many of its principles and rules of proceeding, has at different times undergone careful revision and the most learned and scientific treatment at the hands of its professors, and was very generally received in those Christian states which acknowledge the supremacy of the pope; and it still gives ecclesiastical law more or less to Roman Catholic Christendom, although its provisions have in many countries been considerably modified by the *concordats* (q.v.) which the popes now and then find it expedient to enter into with Roman Catholic sovereigns and governments, whose municipal system does not admit of the application of the C. L. in its integrity. Indeed, the fact of its main object being to establish the supremacy of the ecclesiastical authority over the temporal power, is sufficient to explain why, in modern times, it is found to conflict with the views of public law and government, even in the case of the most absolute and despotic governments.

This ecclesiastical system, however, never obtained a firm footing in England, and the great lawyers and statesmen have always shown not only an unwillingness to defer to its authority, but even an aversion to its rule. There was, however, a kind of national C. L. in England, composed of *legative* and *provincial* constitutions, adapted to the particular necessities of the English church. The legative constitutions were ecclesiastical laws, enacted in national synods, held under the cardinals Otho and Othobon, legates from pope Gregory IX. and pope Clement IV., in the reign of king Henry III., about the years 1220 and 1268. The *provincial* constitutions are principally the decrees of provincial synods, held under divers archbishops of Canterbury, from Stephen Langton, in the reign of Henry III., to Henry Chicheley, in the reign of Henry V., and adopted also by the province of York in the reign of Henry VI. At the dawn of the reformation, in the reign of Henry VIII., it was enacted in parliament that a review should be had of the C. L.; and till such review should be made, all canons, constitutions, ordinances, and synodals provincial being then already made, and not repugnant to the law of the land or the king's prerogative, should still be used and executed. And as no such review has yet been perfected, upon this enactment now depends the authority of the C. L. in England, the limitations of which appear, upon the whole, to be as follows: that no canon contrary to the common or statute law, or the prerogative royal, is of any validity; that, subject to this condition, the canons made anterior to the parliamentary provision above mentioned, and adopted in our system (for there are some which have had no reception among us), are binding both on clergy and laity; but that canons made since that period, and having no sanction from the parliament, are, as regards the laity at least, of no force. See CANONS OF THE CHURCH OF ENGLAND.

In Scotland, Presbyterian though the ecclesiastical system of that country be, the old Roman C. L. still prevails to a certain extent. "So deep hath this canon law been rooted," observes lord Stair in his *Institutes of the Scotch Law,* "that even where the pope's authority is rejected, yet consideration must be had to these laws, not only as those by which church benefices have been erected and ordered, but as likewise containing many equitable and profitable laws, which, because of their weighty matter, and their being once received, may more fitly be retained than rejected." In two old Scotch acts of parliament, made in 1540 and 1551, the C. L. is used in conjunction with the Roman law to denote the common law of the country, the expression used being "the common law, baith canon, civil, and statutes of the realme." See on the subject of this article generally the following authorities—Blackstone's *Commentaries,* by Kerr, vol. i. pp. 65 and 66; Stephen's *Commentaries,* 4th edition, vol. i. pp. 61 and 69—vol. ii. pp.

251, 256, 257, and 290—vol. iii. pp. 45, 48, and 421—and vol. iv. p. 242; Dr. Irving's *Study of the Civil Law;* and Phillimore on the *Influence of the Ecclesiastical Law, etc.*, 1851. See also a discriminating article on this subject in Knight's *Political Dictionary*, 1845; and see Wharton's *Law Dictionary*, 2d edition, 1859. It will also be found carefully treated in Dr. Hook's *Church Dictionary*, 7th edition, 1854. In regard to Scotland, see Stair's *Institutes of the Law of Scotland*, I. 1, 13, and II. 8, 29; and Erskine's *Institutes* of the same law, I. 1, 28.

CANONRY, the office and dignity of a CANON. See CATHEDRAL.

CANONS, BOOK OF, in Scottish ecclesiastical history, a code of canons or rules for the church of Scotland, prepared by the Scottish bishops, in obedience to the command of Charles I., revised by Laud, and confirmed by letters-patent under the great seal, 23d May, 1635. It tended much to increase the dissatisfaction prevalent throughout Scotland, and which soon broke out so violently. It not only required the most strict adherence to the liturgy, then not yet published, but enjoined man y things concerning ceremonies in worship beyond what Laud had been able to introduce in the church of England; it also took away the powers of church-courts, and decreed the penalty of excommunication against all who should deny the government of the church by bishops to be scriptural, whilst its very first canon decreed that penalty against all who should deny the king's supremacy in ecclesiastical affairs.

CANONSBURG, a t. in Washington co., Penn., on the Chartier's Valley railroad, 22 m. s. w. of Pittsburg; formerly the seat of Jefferson college and of the Pennsylvania reform school. Pop. '70, 641 ; '80, 699.

CANONS OF THE CHURCH OF ENGLAND, called constitutions and canons ecclesiastical, agreed upon, with the king's license, in the synod held at London in 1603–04. They were drawn up by the convocation, in order to give effect to the decisions of the conference held at Hampton; and are, for the most part, a digest of old canons, with some new ones added. They are 141 in number. They are the basis of the ecclesiastical law, as far as the clergy are concerned, but they are not binding upon the laity, except in so far as they are declaratory of the ancient canon law. There had been a previous body of canons drawn up in 1571, but these had not been sanctioned by the sovereign. In 1640, the convocation, which was then assembled with the parliament, prolonged its session beyond it, and passed a body of canons of a very arbitrary character; amongst other things, enjoining that on some Sunday in every quarter, every officiating minister should insist on the divine right of kings and their prerogatives, and enforce conformity to the rites of the church of England. In these canons, it was directed that the communion-table should be railed in, and be placed as in cathedrals, as is now done in all churches. These canons were abrogated by an act passed in the 13th year of Charles II. An account of these canons and those now in force may be found at length in Hook's *Church Directory.*—Every clergyman, when instituted to a benefice or licensed to a cure, promises CANONICAL OBEDIENCE to the bishop—i.e., the obedience due according to the canons of the church.

CANO'PIC VASES were vases used by the Egyptian priests to contain the viscera of embalmed bodies. They were arranged in a series of four—the first contained the stomach and larger intestines; the second, the smaller intestines; the third, the lungs and heart; the fourth, the liver and gall-bladder; and each had on its lid the head of the particular deity who was supposed to preside over the contents.

CANO'PUS or **CANO'BUS,** a city of ancient Egypt, from which the Canopic mouth of the Nile derived its name, was situated on the sea-coast, 15 m. e. of Alexandria. The Canopic mouth of the Nile appears to have been at an early period the only one into which foreign ships could enter. At C. the boundry-line between Asia and Africa was drawn by the ancient geographers. There was a temple of Hercules here, which was a secure sanctuary to all who fled to it; also one of Serapis, as several extant Greek inscriptions show. The inhabitants of C., a mixed Egypto-Hellenic people, were infamous, in the Greek and Roman times, for their profligacy. The city declined after the rise of Alexandria. Traces of its ruins are visible about 3 m. from Aboukir.

CANOPUS is also the name of a very brilliant star of the southern hemisphere, in the constellation of the ship Argo, and, as Plutarch relates, received its name from Canopos, the pilot of Menelaus.

CANOPY (Lat. *canopeum;* Gr. *kōnōpeion*, from *kōnōps*, gnat or mosquito). The derivation of this word throws a curious light on its original meaning, which probably was a mosquito curtain. The simplest form of C., in this its primitive sense, is that mentioned by Herodotus (ii. 95), who tells us that the fishermen on the Nile were in the habit of suspending the net with which they had fished during the day on an upright pole, from which it was expanded into the form of a tent, and served to protect them from the attacks of insects during the night. As it has been proved that insects will not pass through the meshes of a net, though wide enough to admit them, it is probable that this simple contrivance may have been quite effectual for the purpose for which it was used. Horace (Epod. ix. 9), and others of the ancient writers, mention gnat-curtains (canopea). Subsquently, the same term came to be used for the projecting covering and hangings of a bed, without reference to their original use, and latterly for any

projecting covering of a similar form, to whatever use it might be adapted, or whatever materials it might be formed. C. is thus used to signify the covering which is borne over the heads of kings and other persons of distinction, and still more frequently over the holy sacrament and the image of Christ, in processions in Roman Catholic countries. See BALDACHIN.

In Gothic architecture, C. is the term applied to those rich coverings which are frequently met with over niches and tombs, and sometimes over doors and windows. It belongs chiefly to the decorated and perpendicular styles, though it was not unknown much earlier. The C. consists of a roof, which may be supported on pillars all round, or may have one, or if in an angle *two*, sides attached to the wall, with dependent ornamental work representing drapery. The early English canopies are usually simple in form; those in French buildings of the same period being greatly more complicated and elaborate, as, for example, those in the cathedrals of Chartres and Bayeux. In the decorated style, the canopies were richly ornamented and very various in form. Some canopies are ornamented by pinnacles supporting smaller canopies, the whole terminating in a structure resembling a small turret, or crocketed spire. In the perpendicular style, though more varied in form, the canopies resemble those in the decorated. Most of the cathedrals and larger churches of England furnish examples of canopies, many of which are enumerated in Parker's *Glossary of Architecture.* For the use of canopies in Italian architecture, see BALDACHIN.

CANO'SA, a t. of southern Italy, in the province of Bari, 13 m. s.w. of Barletta. It is situated on the declivity of a steep hill, upon the summit of which there are the remains of an old castle. It has a cathedral; and in an adjoining court is a tomb to Bohemond, prince of Antioch. It is chiefly remarkable, however, in connection with the discovered antiquities of ancient *Canusium* (one of the chief cities of the Apulians, the origin of which is obscured in the mists of mythology), on the site of whose citadel the modern town is said to stand. The antiquities consist of subterranean sepulchers, containing painted vases and funereal furniture of the most magnificent description in perfect order, painted busts, marble statues, etc. Many of the bodies found here were attired in cloth of gold, with head-dresses gleaming with precious stones, and ear-rings and bracelets of rich and exquisite workmanship. The objects were transferred to the museum at Naples. The ruins of an amphitheater, aqueduct, etc., have also been found. C. suffered by earthquake in 1851. Pop. 14,500.

CANOS'SA, a t. of northern Italy, in the province of Reggio, about 12 m s.w. of the city of Reggio, celebrated as the place where, in 1077, the emperor Henri IV. of Germany obtained absolution from pope Gregory VII., after three days' humiliation. The place, formerly of some importance, is now deserted.

CANO'VA, ANTONIO, the founder of a new school of Italian sculpture, was b. Nov. 1, 1757, at Possagno, a village in the Venetian territory. Having displayed in boyhood great talent in modeling, the artist gained the patronage of Giovanni Faliero, a Venetian senator, by whom he was sent to work under a sculptor at Bassano. His first imaginative performance, "Eurydice," half the size of life, was executed in his 17th year. After this he went to Venice, where his study of art properly began. In 1779, Faliero sent him to Rome, with an introduction to Cav. Zuliano, the Venetian ambassador, and one of the most illustrious patrons of art at this time in Italy. In Rome the first result of his studies appeared in the statue of "Apollo," which must be regarded as his earliest effort in ideal sculpture; but a far greater progress toward the pure style of the antique was evident in his next work, "Theseus with the Centaur." Nevertheless, C. did not rigorously adhere to the severe simplicity of the antique, but rather took pains to mitigate it by a peculiar grace and loveliness of his own, such as characterized his group of "Cupid and Psyche," which was produced soon after he had completed the monument of pope Clement XIV. This is apparent even in the colossal monument of Clement XIII. (erected in St. Peter's, 1792); though this work, on the whole, is a magnificent effort of genius, simple in style, and with nothing overwrought in the figures. Among his other works may be noticed a "Winged Cupid," "Venus and Adonis," a "Psyche holding a Butterfly;" "Penitent Magdalen," in life-size; "Hercules hurling Lichas from the Rock," a colossal work, but not free from affectation; "Kreugas and Damoxenos" (two pugilists), "Palamedes," and "Perseus with the Head of the Medusa," a work which, more than all previous efforts, served to raise his fame. In 1802, C. was appointed by pope Pius VII. chief curator of all Roman works of art in the papal states; but was soon called away to Paris, to prepare the model of a colossal statue of Bonaparte.

After the fall of the French empire, C., in 1815, was employed by the Roman government as ambassador to recover the works of art which had been taken to Paris, and paid a visit to England. On his return to Rome, he was created marquis of Ischia, with a pension of 3000 scudi. This money he expended in the support of art and artists in Rome. C. died in Venice, 13th Oct., 1822. A marble statue was erected to his memory in the church de' Frati, 1827. Another monument to C. was erected in the library of the capitol, by order of Leo XII., in 1833.

It is universally allowed that to C. belongs the honor of having restored to sculpture the position which it had lost among the modern fine arts. After Michael Angelo Buonarotti and Bernini, he was the third of epoch-making Italian sculptors. His delicate

execution and masterly treatment of marble are unrivaled, and even his faults—viz., his exaggerated nicety and carefulness, and his use of corrosives to produce fine finish—served to attract by the novel effects which they produced. The essential characteristic of all his works is sentiment—often verging, however, on sentimentalism—and this also, like his delicacy in details, was accordant with the taste prevalent in his time, and was the chief cause of his popularity, as of his errors. When judged by the sterner principles of antique sculpture, the works of C. are found deficient in that objective or realistic character which Thorwaldsen could express so well.

During his leisure hours C. amused himself in painting, in which he attained such a degree of excellence in following the coloring of the Venetian masters, that his pictures have even deceived connoisseurs. In his private life, C. was a very amiable and benevolent man. Biographies of C. have been written by Missirini (4 vols., Prato, 1824), Cicognara (Venice, 1823), Rosini (Pisa, 1825), and D'Este (Florence, 1864).

CANROBERT, François Certain, De, Marshal of France, b. in 1809, studied in the military school of St. Cyr, and in 1828 entered the army. In 1835, he sailed for Algeria, and during the war in the province of Oran was made a capt. In the storming of Constantine, he was one of the first who entered the breach, when he received a wound in the leg. About the same time he had the decoration of the legion of honor conferred upon him. In 1846. he became lieut.col., and soon after col. In 1848, he had the command of an expedition against the tribes of the Bouaoun, whom he defeated at the pass of Djerma, and was victorious against the Kabyles. As gen. of brigade, in 1850 he led an expedition through the rocky country of Narah, and destroyed the Arab stronghold there. In Jan., 1853, he became a gen. of division. He had the command of the first division of the French army under marshal St. Arnaud, sent to the Crimea in 1854; and at the battle of the Alma, was wounded in the breast and hand by the splinter of a shell. On the death of the marshal, C. took the chief command of the French army. In the war in Italy against the Austrians, in 1859, C. had the command of the third division of the French army; and at the battle of Magenta, June 4, his *corps d'armée* turned the left of the Austrians. In the great battle of Solferino, on the 24th of the same month, his division was hotly engaged, and lost 1000 men in killed and wounded. In 1860, he married Miss Macdonald, a Scotch lady. When war was declared by France against Prussia, in 1870, he was one of the generals in command at Woerth, where the French received such a defeat. C. was shut up in Metz with Bazaine, and became a prisoner in Germany. In 1877, he was elected a member of the French senate.

CANSO, Cape. the eastern extremity of Nova Scotia, and the southern boundary of the entrance of Chebucto or Chedabucto bay. It is in lat. 45° 17′ n., and long. 61° west. —2. (Strait), a passage of 17 m. in length and 2½ in average breadth, connecting the inlet just mentioned with the gulf of St. Lawrence, so as to form an island of cape Breton. Of the three channels between that inland sea and the open ocean, it is the one that is least frequently used by European vessels.

CANSO, Cape, the e. point of Nova Scotia; a port of entry, with a large fishing trade. There is a light on Cranberry island, in 45° 19′ n., 60° 55′ west.

CANSTEIN, Karl Hilderbrand, Count of, 1667–1719; studied law at Frankfort, but did not practice because of failing health. At Berlin he became intimate with Spencer and Francke, who persuaded him to devote his time to increasing the circulation of the Bible, and that led him to form the Bible society at Halle which bears his name. He published the New Testament for about 8 cents, and the whole Bible at a proportionate price. He wrote a *Life of Spenser*, a *Harmony of the Gospels*, and other theological works.

CANT, on shipboard, is a name given to such timbers, near the bow and stern, as lie obliquely to the line of keel. It is also a general term for anything sloping, inclined, or turned aside. "Canting" is to turn anything over, or out of its proper position.

CANT, Andrew, a Scottish divine of the 17th c., was first minister of Pitsligo, in the n. of Scotland, and afterwards in Aberdeen. In July, 1638, he was one of the commissioners sent to that city, to compel the inhabitants to subscribe the national covenant; and in Nov. of the same year, he was a member of the memorable general assembly, held at Glasgow, which abolished Episcopacy in Scotland. He was with the Scots army when it obtained possession of Newcastle, Aug. 30, 1640; and in 1641, on the second visit of Charles I. to Scotland, C. preached before his majesty at Edinburgh. In 1660, in consequence of a complaint presented to the magistrates of Aberdeen, charging him with having published a seditious book, entitled *Lex Rex*, and with fulminating anathemas and imprecations against many of his congregation, C. relinquished his charge and left the town. He died about 1664.

CANTAB'ILE, in music, is found in several significations. In general, it is placed over passages of easy and flowing melody, as well in instrumental as vocal music. In songs, the melodies which lie chiefly in the middle region of the voice are marked C.: extreme tones of the voice have a peculiar *timbre* and character quite foreign to the cantabile. C. marked at the beginning of a piece means rather slow than quick. In the C. style the finest effects can be produced by the singer in swelling, sustained sound, the portamento, etc. C. is also called *cantilene.*

CANTA'BRI, a rude race of mountaineers in ancient Spain, were of Iberian origin, and lived in the district now known as Burgos, and on the coasts of the bay of Biscay, which derived from them its name, *Oceanus Cantabricus.* The most important of their nine towns were Juliobrica (near the source of the Ebro), Vellica, and Concana. The C. are described as like the Scythians and Thracians in hardihood and martial character, sleeping on the bare earth, enduring extreme pain without a murmur, and, like most savages, leaving agricultural toil to their women. Their bravery was evinced in the Cantabrian war, a six years' contest with the Romans, begun under Augustus, and concluded by Agrippa, 25–19 B.C. Tiberius afterwards stationed garrisons in the towns of the conquered C.; but some portion retreated into their fastnesses among the mountains, where they preserved their independence. They are supposed to be the ancestors of the Basques (q.v.).

CANTA'BRIA, a district in Spain on the s. coast of the bay of Biscay. The old geographers give the name to nearly the whole of the Biscayan coast, but it is now restricted to the province of Santander and the e. portion of Asturias; indeed, Cantabria is not now a geographical division.

CANTABRIAN MOUNTAINS, the general name of the several ranges of coast and boundary mountains, extending along the n. coast of Spain, from cape Finisterre, to the southern base of the w. Pyrenees, and so dividing the coast districts from the interior elevated plateau of Castile. The summits of the mountains here and there reach the lower line of the snow region, with a more gentle slope on the s. side, and forming plateau districts from 1600 to 2,000 ft. high on the n., where the slopes are steeper and intersected by coast rivers, leave in several parts only narrow stripes of flat coast-land, and running out into the sea form several bold promontories. The whole group of mountains is named variously by the people of various localities, and includes the Sierra de Aralar, Salvada, Anagña, Sejos, Albas, and Altuna—all more or less wild and romantic, but having those fertile and prosperous trading districts which distinguish the Basque Provinces and Asturias from the sterile central plateau of Spain.

CANTACUZE'NUS, JOHANNES, b. about 1300 at Constantinople; a statesman, general, and historian, and under Andronicus II. had principal charge of the government. When Andronicus died he was left regent, the successor being John Palæologus, then only nine years old. C. was suspected by the empress, fled from Constantinople, and got himself crowned in another place. Six years of civil war followed in which the rivals employed foreign mercenaries of every description, and nearly ruined the empire. C. formed an alliance with the sultan of Broussa, agreeing to send his daughter to his ally's harem and to permit the sultan to make slaves of the Greek subjects. In 1346, he entered Constantinople and became joint emperor with John, but retained full power during John's minority. He badly governed the almost ruined empire until 1354, when John made an easy success, and C. took refuge in a monastery, where he wrote a history of his life and times.

CANTAL, a central department of France, formed out of the s. portion of the old province of Auvergne. It has an area of 2,090 sq.m., and a pop. in '76 of 231,086. See AUVERGNE.

CANTALIVER, or CANTLIVER, a large bracket used in architecture for supporting cornices, balconies, and even stairs. Cantalivers are often highly ornamented.

CAN'TALOUPE, or MUSK-MELON, a well-known fruit, taking its name from Cantalupo in Italy. It is extensively cultivated in the United States, and is much esteemed for the table.

CANTARINI, SIMONE, also known as SIMONE DA PĒSARO or IL PESARESE, an Italian painter, was b. at Pesaro in 1612. He studied under Guido Reni at Bologna; but his intolerable arrogance made him numerous enemies, and in consequence he left the city, and went to Rome, where he won a high reputation, and was thought by many to excel even his master in the graceful finish of his brush. On his return to Bologna, he opened a school, but shortly after accepted an invitation from the duke of Mantua to visit that city. Here also his excessive self-esteem involved him in disagreeable relations with everybody, and at last he quarreled with the duke himself, on which he left for Verona, where he died in 1648, under suspicion either of having poisoned himself, or of having been poisoned by a Mantuan painter whom he had injured. C. was distinguished in modeling and flesh-coloring. A "Madonna upborne by Angels," and a head of Guido when old, in the gallery at Bologna; and others elsewhere, remain as proofs of his skill. His 37 etchings closely resemble the etchings of Guido Reni, and have, in several instances, been fraudulently sold with the mark of the master forged upon them.

CANTA'TA, in music, is a name given to a vocal composition; but it is so very indefinite, that it in no way shows in what respect such composition differs from any other. In Zedler of Halle's great *Lexicon*, the C. is defined as a "long vocal composition, the text of which is Italian," etc.; while in Sulzer's *Theorie der Schönen Künste,* it is said to be "a short piece of vocal music of a pathetic nature," etc. The C. is always more extended and wrought out than the simple song, and consists of different movements.

CANTEEN', is a refreshment-house in a barrack, for the use of the soldiers. The chief articles of food are supplied to the troops direct by the government; but wine, malt liquor, and small grocery-wares, the soldier is left to buy for himself; and the C. is, or is intended to be, a shop where he can make these purchases economically without the necessity of going beyond the precincts of the barrack. No soldier is obliged to buy anything at the C.; he may lay out his small sums elsewhere if he prefer. Formerly, the canteens were under civilians called canteen-tenants, and spirits were sold. Between the years 1836 and 1845, it was found that, among 112 canteens in the United Kingdom, the rent and head-money paid varied from £4 per annum (one at Guernsey) to £1344 per annum (one at Woolwich); they brought in collectively to the government about £70,000 annually. Great intoxication having resulted from the sale of spirits at the canteens, the war office prohibited such sale in 1847; as a consequence, the rents had to be lowered to the extent of £20,000 in the following year, the cantineers finding their profits much reduced. The rent paid was found to be injurious to the soldiers, who were charged higher prices within the barrack than without, and who were thence driven to places where dangerous temptations are at hand. The result of this system being undeniably bad and demoralizing, the war office now makes the C. a regimental establishment, controlled by a committee of officers and with a canteen-sergeant as salesman. Pensioned non-commissioned officers may be appointed canteen-sergeants. The profits are applied for the benefit of the men of the corps.

In French barracks, the C. is a sort of club-room for the whole regiment. The cantineer is a non-commissioned officer, who acts merely as an agent for all, selling the liquors and commodities at prime cost.

CANTEEN, besides its application to a room or building, is a name also given to a vessel used by soldiers to contain whatever beverage may be obtainable on the march or in the field. It is sometimes of tin, sometimes of wood. In the British army, the C. is a wooden vessel, holding about three pints, painted blue, and inscribed with the number or designation of the regiment, battalion, and company to which the soldier belongs.

There is still another use of the word C., as a name for a leathern or wooden chest, divided into compartments, and containing the plate and table-equipage for a military officer when on active service.

CAN'TEMIR, ANTI'OCHUS, or CONSTANTINE DEME'TRIUS, 1704–44; the youngest son of Demetrius Cantemir. He was a member of the St. Petersburg academy; wrote satires, and assisted in fixing versification and developing Russian poetry. At the age of 30 he was sent as minister to Great Britain, and in 1736 to France. He was a successful diplomatist, and was highly esteemed both at home and abroad. Besides translating into Russian the main works of Anacreon and Horace, he wrote odes, satires, and fables, and translated important works from French and Italian.

CAN'TEMIR, DEME'TRIUS, 1673–1723; a son of a Moldavian prince and heir to the throne, which, however, he never claimed, preferring to serve the Turks. In 1710, he was appointed prince to resist the expected invasion of Peter the great. Convinced that ruin would come to the Turks, C. joined the czar and shared in the unfortunate campaign on the Pruth in 1711. When peace was made, Peter refused to surrender him to the Turks, and kept him employed in Russia, where he became a great favorite. His most important work was a history of the rise and fall of the Ottoman empire.

CANTERBURY, a municipal and parliamentary borough, a co. by itself, a cathedral city, and seat of the metropolitan see of all England, in East Kent, on the Stour, 56 m. e.s.e of London, on the high-road from London to Dover. The distance from London by the South-eastern railway is 81 m.; by the London, Chatham, and Dover line, about 60. It stands on a flat between hills of moderate height. It has the aspect of an old town, many of the houses along the high street having gabled ends and projecting fronts. It has little manufacture or traffic. The chief trade is in corn, wool, and hops. Pop. '81, 21,701. Many are engaged in the hop-grounds. C. returns two members to parliament. It is noted for its brawn. Some remains of the walls (1¾ m. in circuit and 20 ft. high) which formerly surrounded C., and one of the gates, still exist. Near the city wall is a large artificial mound, known as the Dane John (probably *Donjon*), and connected with this mound is a public garden, laid out in the end of the 18th c., from the top of which is a fine view of the country around. But the great glory of C. is its magnificent

Cathedral. When St. Augustine became archbishop of Canterbury, 597 A.D., he consecrated, under the name Christ's church, a church said to have been formerly used by Roman Christians. Cuthbert, the 11th archbishop, 740 A.D., added a church to the e. of this. In the course of ages, it received numerous additions, until it assumed its present magnificent form. Among those who helped to repair, enlarge, and rebuild it, were archbishops Odo (940 A.D.), Lanfranc (1070), and Anselm (1093). In 1174, the choir was destroyed by fire, and in order to the rebuilding of it, a number of French and English artificers were summoned. Among the former was a certain William of Sens, and to him, a man of real genius, the work was intrusted. The church was rich in relics: Plegemund had brought hither the body of the martyr Blasius from Rome; there were the relics of St. Wilfred, St. Dunstan, and St. Elfege; the murder of Thomas Becket (q.v.) had recently added a still more popular name to the list of martyrs. The

offerings at these shrines, especially the last, contributed greatly to defray the expenses of the magnificent work. William of Sens did not, however, live to see its completion. He was succeeded by another William, an Englishman, and to him we owe the completion of the existing unique and beautiful choir, terminated by the corona or circular chapel called Becket's crown. Gervasius, a monk, who witnessed the fire of 1174, and has left an account of it, tells us that the parts of Lanfranc's church which remained in his time were the nave, the central and western towers, the western transepts, and their eastern chapels. In the 14th c., the nave and transepts were transformed into the perpendicular style of that period. The central tower, called the Angel steeple, was carried up (1486–1504) to about double its original height, also in the perpendicular style; it is 234 ft. high, and 35 ft. in diameter. The n.w. tower was taken down in 1834; it was 113 ft. high, and divided into five stories. The Norman plinth still remains on each side of the nave in the side aisles, and portions of Norman ashlaring may still be seen about the transepts outside the w. wall, and on the eastern piers of the great tower. The indiscriminate use of the "round" or "Norman," and the "pointed" or "early English" arch, is also a very striking feature in the eastern part of the building. The Lady chapel, now called the Dean's chapel, stands on the n. side of the church, and was built in 1468; the roof is a fan-vault. The n. transept is called the Martyrdom, for here took place the murder of Becket, on Tuesday, Dec. 29, 1170. Fifty years later, his remains were translated from the crypt to a shrine in the newly erected Trinity chapel, eastward of the choir. About the year 1500, the yearly offerings at this shrine amounted to £4,000; but they had then declined much in value. A curious mosaic pavement still remains in front of the place where the shrine stood, and the stone steps which lead up to it are worn by the knees of countless pilgrims; but the shrine itself was demolished in 1538, and the bones of the saint burned by order of Henry VIII. In 1643, the building was further "purified," as it was called, by order of parliament. Still very many most interesting monuments remain—such as the tombs of Stephen Langton; that which is commonly, but wrongly, supposed to be the tomb of archbishop Theobald; with those of the black prince, of Henry IV., of archbishops Maphan, Peckham, Chicheley, Courtenay, Sudbury, Stratford, Kemp, Bourchier, Warham, and of cardinal Pole. The total exterior length of the cathedral is 545 ft., by 156 in breadth at the eastern transept. The crypt is of greater extent and loftier—owing to the choir being raised by numerous steps at the east end—than any other in England.

The archbishop of C. is primate of all England, metropolitan, and first peer of the realm. He ranks next to royalty, and crowns the sovereign. His ecclesiastical province includes all England, except the six northern counties. Among his privileges, he can confer degrees in divinity, law, medicine, and music. His seats are at Lambeth and Addington park. He is patron of 149 livings, and has an income of £15,000 a year. There are 14 old churches in C., mostly of rough flint, and containing fragments of still older structures. St. Martin's church stands on the site of one of the 7th c., and is partly built of ancient Roman brick and tile. Attached to the cathedral is a grammar school, remodeled by Henry VIII. Part of St. Augustine's Benedictine abbey still remains, with its fine gateway, near the cathedral. It occupied, with its precincts, 16 acres. The old buildings have lately received large modern additions, in order to fit them for the purposes of a missionary college in connection with the church of England. Another recent institution for education is the clergy orphan school, which occupies a conspicuous position on St. Thomas's hill, about a mile out of the city. The ruins of a Norman castle, 88 by 80 ft., the third in size in England, stands near the city wall. C. stood, in Roman times, at the union of two Roman roads from Dover and Lympne, the chief seaports of the Romans. C. was the capital of Kent, and the center from which England was Christianized. St. Augustine, the apostle of England, sent by Gregory I., was the first archbishop, and baptized king Ethelbert of Kent. C. was the Saxon *Caer Cant*, city of Kent, and capital of the kingdom of Kent. The Danes, in the 9th, 10th, and 11th centuries, often ravaged and burned the city. Henry VIII. confiscated the treasures of the cathedral, and Edward VI. levied fresh exactions from it. The cathedral suffered much in the parliamentary struggles, but it has since been repaired.

CANTERBURY, a settlement of about 13,000 sq.m., on the e. coast of South island, New Zealand, with Christchurch as its capital, and Lyttleton as its port. The district was settled in 1850 by the Canterbury association, a society of peers, bishops, and commoners interested in the colonization of New Zealand. It has a coast-line of about 200 m., and is well watered by numerous rivers. Coal (in abundance), iron-ore, fire-clays, and quartz have been discovered in the province, and several coal-mines are in operation. On the eastern side of the great range of hills are the far-famed Canterbury plains, the great sheep district of the colony—"3,000,000 of acres rolling back in gentle rise 40 m., to the foot of the central highlands, watered by 20 rivers, and spreading n. and s. further than the eye can reach." The natural pastures of C. are very fine; and to this circumstance is mainly due the rapid advance in prosperity of the country. Pop. '81, 111,049. In 1876, wheat occupied 57,500 acres, estimated to yield 1,770,363 bushels; oats, 72,522 acres, estimated to yield 2,788,688 bushels; barley, 16,820 acres, estimated to yield 620,699 bushels; and the estimated yield of potatoes was 17,895 tons. The total value of exports in 1875 was £42,750; of imports, £1,302,440. Very excellent timber grows in the province.

CANTERBURY BELLS. See CAMPANULA.

CANTHAREL'LUS. See FUNGI, EDIBLE.

CANTHAR'IDINE. See CANTHARIS.

CAN'THARIS (Gr. a small beetle, plural *canthar'ides*), a genus of insects of the order *coleoptera*, section *heteromera*. See COLEOPTERA. It belongs to a family called *trachelides*, or necked beetles, the head being separated from the thorax by a distinct neck or pedicle, and forms the type of a subdivision of that family called *cantharidiæ*, many of the species of which possess blistering properties analogous to those of the common BLISTERING FLY, SPANISH FLY, or BLISTER BEETLE (*C. vesicatoria*). This insect, the best known and most important of the genus, is about an inch long; has a large heart-shaped head, rather broader than the thorax; thread-like antennæ three times longer than the head; a nearly quadrangular thorax; and soft elytra (wing-covers) concealing the abdomen, and of equal breadth throughout. It is of a bright glossy green color. The common blistering fly is found in the s. of Europe, and in the s. of Siberia. It is abundant in Italy, Sicily, and Spain, in the s. of France, and in some parts of Germany and Russia. It is rare in England. The larva is not well known. The perfect insect feeds on the leaves of the ash, privet, lilac, elder, and honeysuckle; and rests on them during the night, the day being its time of activity. It is therefore taken by beating the branches of the trees in the morning or evening, when it is comparatively lethargic, a cloth being spread below to receive the insects as they fall. The gathering of *cantharides* takes place, in the s. of France, in the month of May. It requires great caution to prevent injury to those who engage in it, the insects emitting a volatile substance with a strong smell, which causes inflammation of the eyes and eyelids, convulsive sneezing, and irritation of the throat and bronchial tubes, nor can they be handled without danger of blistering. Those who collect them, therefore, generally wear gloves and veils. Unpleasant effects have been experienced from even sitting under trees on the leaves of which cantharides were numerous. Various methods are employed for killing cantharides when they have been taken; the cloths containing them are very generally immersed in hot vinegar and water, and they are afterwards carefully dried; sometimes they are killed by the vapor of vinegar, and sometimes by oil of turpentine. Unless kept with great care, they soon begin to lose their active properties, although, in stoppered bottles, they remain fit for use for years. They are very liable to be injured by mites, and afford a favorite food also to a kind of moth and to some other insects. They are imported into Britain from the s. of Europe, and also from St. Petersburg.

The active principle of the blistering flies is *cantharidine*, which possesses such powerful blistering properties, that $\frac{1}{100}$th of a grain placed on the lip rapidly causes the rise of small blisters. Administered internally, blistering flies cause heat in the throat, stomach, intestines, respiratory organs, etc.; and if in large doses, they give rise to inflammation of a serious nature, and sufficient to cause death. Externally, they are employed as a *blistering agent*. There are various medicinal preparations of blistering flies, such as *vinegar of cantharides*, obtained by macerating blistering flies in acetic acid; *tincture of cantharides*, procured by digesting blistering flies in proof-spirit, etc.; but that most commonly employed is *plaster of cantharides* or *blistering plaster*, obtained by mixing equal parts of blistering flies, yellow wax, resin, and lard. See BLISTER.

CANTICLES, a word which literally signifies songs, but which is specially applied to a canonical book of the Old Testament, called in Hebrew *The Song of Songs*—i.e., the most beautiful song. The author is commonly supposed to be Solomon, and in the rich luxurious splendor of its coloring, it admirably harmonizes with the "golden time" of that magnificent monarch. The theme which it celebrates is love; but what kind of love, whether earthly or spiritual, is a question that has perplexed Biblical critics. The oldest interpretations are allegorical, and are either political or religious. The former of these, considered C. as the symbolical expression of a deep longing for the reunion of the kingdoms of Judah and Israel; the latter, of the love of God for his chosen people, the Jews. The religious interpretation passed over from Judaism to Christianity, and assumed a new aspect in consequence. Origen found the beloved bridegroom in Christ, and the bride in the church or the believing soul. Only among the theologians of the Syrian school do we find an effort made to adhere to more intelligible principles of interpretation, but the "mystical view" obtained the upper hand, and has continued to be the predominant view of the poem amongst orthodox theologians. For a while an attempt was made to distinguish between a primary and a secondary sense, both more or less directly present to the mind of the author; but modern scholarship in the main contents itself with endeavoring to fix the primary or literal meaning. Nor is this an easy task. Some commentators hold, for example, that C. is an anthology of detached idyls; others argue that it is a dramatic unity composed of connected parts. Ewald has done much to establish the latter view. Ewald's followers hold that the poem was written about the middle of the 10th c. B.C. in the northern kingdom of Israel, and conceived in a spirit of hostility against the luxurious court of Zion. Solomon, the type of a sensual monarch, has carried off to his harem a northern shepherd maiden, who in the poem appears surrounded by the ladies of his court. The king fails even by the proffer of honorable espousals to overcome the maiden's fervent attachment to her shepherd lover

in the north country, and wholly abashed, ceases to press his suit. Finally, true and chaste love triumphs in the union of the peasant lovers.

CANTIRE, or KINTYRE (Gaelic, headland), a long narrow peninsula of Argyleshire, running n. and s. between Arran isle and the Atlantic, and united at the n. end with the mainland of Scotland, by the isthmus of Tarbet, a mile broad between e. loch Tarbet, a small loch or bay of loch Fyne, and w. loch Tarbet. It is 40 m. long, and, on an average, 6½ broad. The surface is much diversified by low, undulating, moorish hills, with many lochs. The highest point is Bennear, 1515 feet. It contains much cultivated land. The n. four fifths of C., and the s.w. corner round the Mull, or promontory, of Kintyre, consist chiefly of mica slate. Old red sandstone occurs on the s.e. shore. Coal is found between Campbelton and the w. coast. A light-house, 297 ft. above the sea, stands on the Mull of Kintyre. C. includes 10 parishes. Pop. about 18,000. Campbelton (q.v.) is the chief seat of population. C. was in ancient times peopled by Picts and Celts more densely than the rest of Scotland. The Scots from Ireland subdued it in 210 A.D., were expelled from it in 446, but returned in 503 under Fergus, the first Scottish king, who fixed his seat at Campbelton. Kenneth II. (MacAlpine), on defeating the Picts in 843, removed to Forteviot. From the 8th to the 12th c., C. was occupied by Northmen from Scandinavia, and afterwards by the Macdonalds of the isles, and more lately by the Campbells. Many burying-grounds and small ruined chapels or monasteries in C., show its former populousness. Near these chapels, and in the villages, are many high, upright slate crosses, with rude figures and inscriptions on them. C. contains many ancient watch or ward forts often vitrified.

CANTILEVER BRIDGE. See page 888.

CANTIUM, a Roman district in ancient Britain, covering nearly the same territory as the modern co. of Kent. Cæsar speaks of the inhabitants as the most civilized people of the island.

CANTO FERMO, in church music, means plain song, or choral song in unison, and in notes all of equal length. Its introduction into the Christian church is attributed to pope Gregory the great, before the invention of the modern notation. See also GREGORIAN TONES.

CAN'TON. In heraldry, the C. occupies a corner of the shield, either dexter or sinister, and in size is the third of the chief. It is one of the nine honorable ordinaries, "and of great esteem."

CANTON (from the Fr. *canton*, a corner, a district; Ger. *kante*, a point, corner, border; allied to Eng. *cantle*) signifies in geography a division of territory, constituting a separate government or state, as in Switzerland. In France, C. is a subdivison of an arrondissement.

CANTON, a city in Fulton co., Ill., on the Chicago, Burlington and Quincy, and the Toledo, Peoria and Western railroads; 210 m. from Chicago, and 28 m. from Quincy; pop. '80, 3,762. Manufacturing and coal mining are the main industries.

CANTON, a t. in Lewis co., Mo., on the Mississippi river and the Mississippi Valley and Western railroad, 200 m. above St. Louis, and 22 m. below Keokuk; pop. '80, 2,632. It is a prominent shipping place, has a number of manufactories, and is the seat of Canton university, an educational institution under the charge of the Christian denomination.

CANTON, Mass. See page 889.

CANTON, a t. in St. Lawrence co., N. Y., on Grass river and the Rome, Watertown and Ogdensburg railroad; 60 m. n.e. of Watertown; pop. '80, 6,275. It is the co. seat, and has a court-house, almshouse, St. Lawrence university, and several churches. There is abundant water-power, used in the manufacture of lumber, flour, etc.

CANTON, a t. in Stark co., O., on the Pittsburg, Fort Wayne and Chicago railroad, 100 m. n.e. of Columbus. There is abundance of water-power, and considerable manufacturing is carried on. Coal and limestone are found, and the surrounding country is a fine wheat-growing district. Pop. '80, 12,258.

CANTON, a large commercial city and port in the s. of China, and capital of the province of Kwang-tung (of which the name C. is merely a corruption). It is situated in lat. 23° 7′ 10″ n., and long. 113° 14′ 30″ e., on the n. side of the Chookeang, or Pearl river, in a rich alluvial plain, 32 m. from the sea. The river (the entrance to which is known by the name of the Boca Tigris, a Portuguese translation of the Chinese *Hu-mun* ("Tiger's Mouth"), is very picturesque. The city is surrounded by a brick rampart 6 m. in circumference, and entered by 12 gates, to each of which a guard-house is attached. It forms an irregular square, and is divided by a wall into the n. and s., or old and new city. The former is inhabited by the Tartar population, the latter by Chinese; and between the two, communication is maintained by four gates in the separating wall. The suburbs are very extensive, and in one of these, facing the river, stood the European factories or *hongs*. Most of the streets of C. are crooked and labyrinthine beyond description, but there are a small number of straight thoroughfares which make it easy enough for a stranger to find his way. As a rule, a tolerably straight street leads from the water-side to each gate of the city on the southern front, and is more or less prolonged through the interior. Many of the streets are devoted to distinct trades; thus, there is "Carpenter" street, "Apothecary" street, etc. The Joss-houses, chiefly

Buddhist temples, are said to be 124 in number. The largest of these, on Honam island, covers seven acres, and has 175 priests attached. It is called *Hae Chwang Sze*, or "the temple of the ocean banner." Another famous structure is "the temple of the five hundred gods," situated in the western suburbs. There are also several many-storied towers or pagodas, a Mohammedan mosque, founded about A.D. 850 by the Arabian voyagers, who then were accustomed to visit C., a foundling-hospital, an English and an American missionary hospital. Streets of wooden houses were formerly to be seen on the river-side, but these were swept away during the late quarrel with Yeh; and one large site that they occupied was walled in for the purpose of erecting new foreign factories, the old ones having been totally destroyed by fire. A very remarkable example of life upon the water is the boat-town of Canton. The total population of the city has been vaguely estimated at 1,000,000. The *climate* of C. may be pronounced healthy; though the heat from June to Sept. is oppressive, and the thermometer sometimes, though rarely, stands at 100° in the shade. In ordinary years, the winter minimum is 42°, and the summer maximum 96°. The n.e. monsoon commences in Oct., and is the prevailing wind till Mar., when the s.w. monsoon sets in. Its average temperature is 70½° F., and the annual fall of rain 70.625 inches. The Cantonese are notorious for their turbulence and hatred of foreigners, and the European factories have more than once been attacked by infuriated mobs, who were only kept at bay by force of arms. This hostility may, however, be greatly due to the baneful influence of those in power; for here the government of the mandarins of the present Manchu Tartar dynasty appears to have reached its maximum of corruption and barbarity, and and was fitly represented by the notorious Yeh, late governor-general of Kwang-tung and Kwang-se. The author of *Twelve Years in China* gives us some startling facts illustrative of mandarinic rule in this part of China. After the defeat of the Triad rebels, who besieged C. in 1844–45, it is estimated that 1,000,000 of people perished in the province.

The admirable situation of C. for conducting traffic explains how, from an early period, it was a favorite port with foreign merchants. The Arabs, as has been said, made regular voyages hither as early as the 9th century. The Portuguese found their way to it in the 16th c., and were followed by the Dutch a hundred years later. These in turn were overtaken and supplanted by the English before the close of the 17th c., and an immense trade was carried on by the agents of the East India company. Their monopoly ceased on the 22d April, 1834. Since that date the proceedings of the C. government officers have originated two wars with the British. The city was captured by the allied French and English forces Dec., 1857, and continued to be garrisoned by them till Oct., 1861. See CHINA. After the treaty of Nankin (signed Aug. 29, 1842), C. was known as one of the five ports; Amoy, Foochow, Ningpo, and Shanghai having also been thrown open to foreign commerce.

The chief exports from C. are tea, silk, sugar; the chief imports, raw cotton, piece-goods, opium, metallic wares, etc. "War and rebellion" (say the authors of the *Treaty Ports of China and Japan*, Lond. and Hong-Kong, 1867), "the opening of Hankow as a shipping port for tea, and, above all, the proximity of Hong-Kong and Macao to the delta of the Canton river, with its unrivaled facilities for smuggling, have robbed C. of the pre-eminence it so long enjoyed in commercial prosperity." Yet the following statistics show that the city is recovering ground:

	Total Value of Imports in Mexican Dollars.	Total Value of Exports in Mexican Dollars.
1860	18,415,727	16,257,623
1861	12,977,353	15,811,512
1862	10,580,928	17,742,590
1863	9,505,285	16,083,062
1864	8,192,795	13,659,177
1865	10,556,602	18,054,577
1866	14,171,101	18,832,622
1867	14,090,581	18,403,154
1868	12,991,266	18,491,156
1869	11,487,679	20,010,626
1870	12,053,394	19,857,543
1871	15,661,889	23,612,439

In 1874, the total value of exports was £4,610,470; of imports, £1,985,701, exclusive of treasure. The revenue, '78, was £280,206, and 1718 vessels entered the port.

The Middle Kingdom, by Dr. S. W. Williams; *The Chinese*, by sir John Davis; Meadow's *Chinese; Twelve Years in China* (Edin. 1860); *Report of the Missionary Hospital in the Western Suburbs of Canton; Treaty Ports of China and Japan* (Lond. and Hong-Kong, 1867).

CANTON, JOHN, 1718–72; an English natural philosopher, who made valuable discoveries in the then new science of electricity. For constructing artificial magnets he was honored with the membership and a gold medal of the royal society, and, in 1751, he became one of the council of the society. He was the first person in England to verify Franklin's theory of the identity of lightning and electricity, having, in 1752,

obtained fire from the clouds during a thunder-storm. He and Franklin almost simultaneously discovered that some clouds were charged with positive and others with negative electricity, a circumstance that made them warm personal friends. C. opposed the theory then generally accepted that water was incompressible.

CANTONMENTS, in the general operations of European armies, are temporary resting-places. Many circumstances, especially the state of the weather and the supply of food, influence a gen. in determining whether to go into C. or to encamp, in the intervals between active operations; or he may take the former course during an armistice. The quartermaster-gen. previously examines the district, and determines how many men and horses to place in each village; arrangements are also made for a main-guard, cavalry pickets, alarm-posts, road-barricades, lines of sentries, mounted orderlies, etc., to guard against a sudden surprise from the enemy. In C. the men are not generally under canvas, as described in CAMP.

In India, C. are *permanent* places, regular military towns, distinct and at some little distances from the principal cities. If on a large scale, such a cantonment contains barracks for European cavalry, infantry, and artillery; rows of bungalows or houses, each inclosed in a garden, for the officers; rows of huts for the native soldiery; magazines and parade-grounds; public offices and buildings of various kinds; and a bazaar for the accommodation of the native troops. During the revolt in 1857–58, most of the outbreaks began in the cantonments. It was in the cantonment outside Cawnpore that Nana Sahib commenced his treachery.

CANTONNÉE, in heraldry. When a cross is placed between four other objects, e.g., scallop shells, it is said to be cantonnée.

CANTON'S PHOSPHORUS, or PYRO'PHORUS, is obtained by heating in close a vessel 3 parts oyster-shells and 1 part sublimed sulphur, when the sulphuret of calcium (CaS) is formed, which takes fire when exposed to or thrown into the air.

CANTOR. See PRECENTOR.

CANTU, CESARE, one of the best of modern Italian authors, was b. Sept. 5, 1805, at Brescia, in northern Italy, and was educated at Sondrio, where he was appointed professor of *belles-lettres.* Having been imprisoned for the offense of expressing liberal tendencies in a historical work on Lombardy, C. spent his leisure hours in describing the sorrows of a prisoner in the form of a historical romance, *Margherita Pusterla* (Florence, 1845). C. has also written several religious hymns and songs, which have become popular; but his great work is the *Storia Universale* (35 vols., Turin, 1837–42). His *History of Italian Literature* appeared in 1851; *History of the Last Hundred Years,* 1852; *History of the Italians,* 1859; and *Milano, Storia del Popolo e pel Popolo,* 1871.

CANTURIO, or CANTU', a t. in northern Italy, 5 m. s.e. of Como. It is situated in the midst of a rich district, has a church with an elegant tower, which served as a beacon during the middle ages, and manufactures of iron-wares. Pop. 5,500.

CANUN, a Turkish musical instrument, strung with gut-strings; is played on by the fingers, on which are thimbles of tortoise-shell, pointed with pieces of cocoa-nut, forming plectra for striking the strings with. The C. is a favorite instrument with the ladies in seraglios, many of whom produce very pleasant music and harmony on it.

CANUTE, or CNUT, succeeded to the rulership of the Danes in England on the death of his father, Swein or Sweyn, and was by them proclaimed king of England. On the death of Ethelred, he shared the sovereignty with Edmund Ironside, who ruled over the s., while C. was monarch over the n. of England. The sudden decease or assassination of Edmund made C. sole ruler in 1017, and he continued to reign until his death, in 1035 or 1036. His rule was marked at first by cruelty, but when all who were likely to interfere with his power had been disposed of, he exhibited great mildness and justice, combined with talent and judgment. The Anglo-Saxons, whose complete subjugation he had effected, did not feel their chains: they had experienced no such good government since the time of Alfred and Athelstane. He was easily accessible to all his subjects; and won the hearts of the people by his love song and ballad, and his liberal patronage of gleemen. One verse of an English song written by C. is still extant. As soon as English affairs were settled, C. superseded his brother Harold as king of Denmark; and in 1028 he extended his dominion over Norway—becoming thus one of the most powerful princes of Europe. In his latter years he was devout.

CANVAS, regarded from an artist's point of view, is the principal material upon which oil-paintings are made. Two kinds are prepared for this purpose, of which the best is called *ticking.* Before it is put into the artist's hands, it is usually *primed,* or grounded (see GROUND) of a neutral gray, or other tint, as he may direct. Certain sizes of C. being in greater request than others, are kept ready stretched on frames. Those used for portraits are known by the names of *kit-cat,* which measures 28 or 29 in. by 36: *three-quarters,* 25 by 30 in.; *half-length,* 40 by 50; *Bishop's half-length,* 44 or 45 by 56; *Bishop's whole length,* 58 by 94.

CANVAS, SHIP'S. See SAIL, SAILCLOTH.

CANVAS-BACK, *fuligina* (*athya*) *vallisneria*, a species of duck frequenting the Atlantic coast of the United States, greatly prized for its flesh. The canvas-back reaches its highest perfection in and around Chesapeake bay, where these birds pass the winter after returning from their breeding grounds in the far north-west. In its annual migrations it is taken in great numbers in the marshes which surround the southern extremity of lake Michigan, where the *zostera vallisneria*, or so-called wild celery, known to be identical with the plant of that name in the Chesapeake bay, abounds.

CANZO'NÉ is the name of one of the oldest and most prized forms of the Italian lyric. The word is borrowed from the Provençals, whose *cansôs* or *chansôs*, however, were not restricted to any precise form, but were simply verses intended to be sung. The Italian writers first attempted to regulate the wayward and arbitrary character of the Provençal *cansôs;* Dante, and subsequently Petrarch, being especially successful. The *canzone Petrarchesca* or *Toscana* was any considerable lyrical poem, composed of stanzas exactly corresponding to one another in number of lines, measure, and position of rhymes, and which customarily closed with a short stanza. About the end of the 16th c., the Italian writers began to deviate from the strict form of the Petrarchian canzone. Torquato Tasso and Chiabrera are the most notable names in the new movement. The most of the canzones of the latter—called by their author *canzonette*—are written in short lines and stanzas, the position of the rhymes being also completely arbitrary.

***CAOUTCHOUC'**, Gum Elastic, or India Rubber, a substance which, on account of its peculiar properties, is extensively used in the arts, and of which the use is continually and rapidly increasing. It is one of the products of the wonderful chemistry of nature, being found in the milky juices of plants, and most abundantly in the natural orders *moraceæ, artocarpaceæ, euphorbiaceæ, apocynaceæ, asclepiadaceæ;* and *papayaceæ.* It exists in the milky juice of plants growing in temperate climates; but it is only in tropical and subtropical countries that it occurs so abundantly as to be of economical importance. Its uses to the plants in which it is elaborated have not been ascertained; and the conjectures of theorists on this subject are not supported by arguments sufficient to give them much probability. In the milky juice, the C. is diffused in the form of minute globules, and not, strictly speaking, in solution; and when the juice is extracted from the plant, and allowed to stand for a short time, these globules separate from the watery part of it, and form a sort of cream on the top, or, in close vessels, appear throughout it as a flaky coagulum. C., as well as some of its useful and curious properties, must have been known in America at a very early period, because balls made of the *gum of a tree*, lighter and bouncing better than the wind-balls of Castile, are mentioned by Herrera when speaking of the amusements of the natives of Hayti, in his account of Columbus' second voyage. In a book published in Madrid in 1615, Juan de Torquemada mentions the tree which yields it in Mexico, describes the mode of collecting the gum, and states that it is made into shoes; also that the Spaniards use it for waxing their canvas cloaks to make them resist water. More exact information regarding C. was afterwards furnished by M. de la Condamine, who visited South America in 1735, but it is curious to note that some of the purposes for which india-rubber is most extensively used at the present time are the same as those for which it was employed in South America nearly three centuries ago. It was at first known by the name of *elastic gum*, and received that of india-rubber from the discovery of its use for rubbing out black-lead pencil marks, for which purpose it began to be imported into Britain in small quantities about the end of last c., being much valued by artists, and sold at a high price. Even before this time its employment for the manufacture of flexible tubes for the use of surgeons and chemists had been successfully attempted; but the expensive character of the solvents then known for it, prevented its general application to any purpose in the arts. It was not till 1820 that its employment began to extend beyond the rubbing out of pencil marks, although in the meantime the quantity imported had considerably increased. Its application to the manufacture of water-proof cloth first gave it commercial importance. About the same time a method was discovered of fabricating articles of various kinds by casting C. in molds. Its elasticity and flexibility, its insolubility in water, and its great impenetrability to gases and fluids in general, have now been found to adapt it to a great variety of uses; but for by far the greater number of its applications it is now employed in the vulcanized state.

The C. of commerce is obtained most largely from South America, but considerable quantities are also procured from British India, the Indian archipelago, the west coast of Africa, and the Mauritius. During the year 1872, the actual imports of this material into Great Britain were:

	Cwts.
From Brazil	68,143
" New Granada, Ecuador, and Central America	16,390
" British India	13,855
" Strait Settlements	15,296
" West Coast of Africa	14,135
" Mauritius	10,433
" Other Countries	18,862
Total	157,114

In 1852, the total imports were only 15,269 cwts.; in 1862, 59,703 cwts.; and in 1876, 157,509 cwts. The average annual yield of Brazil for the five years preceding 1871, according to a table sent from that country to the Vienna exhibition of 1873, was about 5,000,000 kilogrammes. The value of the 169,587 cwts. of C. imported in 1880 was £3,387,947.

Brazilian C. is the product of several species of *siphonia* (natural order *euphorbiaceæ*), but chiefly *siphonia elastica*. Bates says that "this tree is not remarkable in appearance; in bark and foliage it is not unlike the European ash, but the trunk, like that of all forest trees, shoots up to an immense height before throwing off branches." The C. of New Granada, Ecuador, and Central America is obtained from *castilloa elastica* (nat. ord. *artocarpaceæ*), that of East India from the beautiful glossy-leaved *ficus elastica* (nat. ord. *moraceæ*), now so common as an ornamental plant in our conservatories, that of Borneo from *urceola elastica*, and that of western Africa from several species of *landolphia*, and also *ficus*. Species of *vahea*, *willughbeia*, *euphorbia*, and other genera likewise yield useful varieties of C., and the sources of some kinds are unknown.

C. is sometimes collected by cutting the trees down, but much more usually by making simple incisions in the trunks. The method of collecting and preparing the liquid C. is thus described in a work recently published at Rio Janeiro. In a few hours, the juice which flows out fills the basins, made of large leaves and plastic clay, which are adapted to the lower part of the tree. It is then poured into other vessels of various shapes; in a short time it becomes thickened, and solidifies in consequence of the evaporation of the liquid part. In order to dry it completely, the practice is to expose it to a gentle heat; for this purpose it is suspended over a brazier lighted with wood, and the flame maintained with the fruits of auricuri, in such a manner that it may receive the smoke, hence the blackish color which the C. of commerce generally presents. Whilst it is liquid, it is fashioned by means of molds, according to the purposes to which it is destined. An attempt has recently been made to import the juice of the tree, and subject it to the drying process in this country, but little has as yet been imported into Britain. The characters of the juice are, that it possesses the consistence of cream, has a yellow color, is miscible with water, but not with naphtha or other of the solvents of ordinary C., and its specific gravity varies from 1.02 to 1.41—ordinary C. being 930. The juice contains about 30 per cent of caoutchouc. When heated, it coagulates (as the glaire of egg does), owing to the presence of albumen; and exposed to the air, it dries up and leaves a film of caoutchouc. In the preparation of pure C., the natural juice is mixed with five or six times its bulk of water, and then either heated or mixed with common salt or hydrochloric acid, when the pure C. separates as a white opaque substance, which becomes transparent when dry. Pure C. is a carbo-hydrogen, its composition being carbon 87.5 and hydrogen 12.5.

Para C. is the best, and commands the highest price in the market. The other South American kinds are of medium quality. East Indian rubber—naturally a fine quality—is too often injured by adulteration and careless collecting. The poorest kind is the w. African, being clammy, offensive in its odor, and only slightly elastic.

Commercial C. is a tough fibrous substance, possessing elastic properties in the highest degree. Reduced to the temperature of freezing water (32° F.), it hardens, and in greater part, if not entirely, loses its elasticity, bnt does not become brittle. When heated, as by placing in boiling water, it softens, and becomes very much more elastic than at ordinary temperatures, though it does not in any degree dissolve in the water. If suddenly stretched to seven or eight times its original length, it becomes warm; and if kept in this outstretched form for several weeks, it appears to lose, in great part, its elastic properties, and in this condition is readily cut into those thin threads which are used in the *elastic* put in gloves, bonnets, etc., and the elasticity of which is readily renewed by the application of gentle heat. Of late years, however, elastic thread is usually prepared with vulcanized rubber. Commercial C. is insoluble in water and alcohol, is not acted upon by alkalies or acids, except when the latter are concentrated, and heat is applied; but is soluble in ether, chloroform, bisulphide of carbon, naphtha, petroleum, benzol, and the essential oils of turpentine, lavender, and sassafras. Many other essential and fixed oils, when heated with C., cause it to soften, and produce thick glutinous compounds, especially linseed oil, which, in the proportion of 1¾ lb. of the oil to 4 ozs. C. in thin strips or films, yields a solution which, when strained, is of great use in rendering shoes, cloth, etc , water-proof. When heated to 248° F., C. fuses; and at 600° it is volatilized, at the same time undergoing decomposition, and yields a liquid called *caoutchoucine* or *caoutchisine*, with the specific gravity 680, and possessing great solvent powers over C. and other substances. Caoutchoucine is necessarily very expensive, and hence its use is limited; but cordage steeped in it and dried acquires great supple and tenacious properties, and cloth saturated with it, and dried by exposure to the air, becomes water-tight.

In the employment of C. as a branch of manufacture, the first operation is the purification of the crude material as it comes from abroad. The crude material is cut into minute shreds, and washed by powerful machinery, immersed in water, which releases the solid impurities, and the pure C. being removed, is placed on iron trays, and dried in a room heated by steam. The material then undergoes a process of kneading under very heavy rollers, which causes the adhesion of the various pieces of C. to each other,

and ultimately yields a mass or block of C. in which the condensation is so perfect that all air-holes, and other cells and interstices, disappear. The block of C. is then cut under water by powerful knives or shears into sheets, from which the pieces sold by stationers may be shaped out, or from which C. bands or thread may be obtained. In the manufacture of square threads, mere cutting is had recourse to; and the delicacy of the operation may be understood when it is stated that 1 lb. of C. will yield 32,000 yds. of thread. The round thread elastic is prepared from C. which has been treated with about double its weight of bisulphide of carbon, containing about 5 per cent of alcohol, which yields a soft material resembling in consistence bread dough or putty; and this being squeezed through a series of small holes, is obtained in minute round threads, which are first received on an endless piece of velvet and ultimately on an endless web of common cloth 500 to 600 yds. long, during the transit of the threads across which, the solvent or bisulphide of carbon evaporates, and leaves the caoutchouc. When it is wished to weave these threads into cloth, they are wound upon bobbins, taking care to stretch the C. as much as possible, so as to deprive it, for the time being, of its elasticity; and after it has been woven into the cloth, a hot iron is passed over the fabric, and immediately the C. resumes its elasticity.

In the manufacture of water-proof clothing, or Mackintoshes (see MACKINTOSH), which was the first application of rubber on a large scale, the C. is made into a solution with spirits of turpentine, or other solvent, and spread upon the cloth; when thus coated, the fabric is pressed between heavy rollers. This variety of water-proof cloth has now, however, been almost entirely superseded by another kind made with vulcanized rubber, which we shall notice presently.

Vulcanized Caoutchouc.—Pure india-rubber is now used only to a limited extent in the arts, but it is applied in the vulcanized state to an almost endless variety of purposes. The remarkable change which C undergoes when mixed with sulphur and heated, according to circumstances, from 240° to 310° F., was discovered by Charles Goodyear, in America, in 1843, and independently, about the same time, by Mr. Thomas Hancock, in England. In the process of vulcanizing, the rubber, as a preliminary step, is either torn into shreds or crushed into thin pieces by machinery, and afterwards washed. There are two principal kinds of vulcanized rubber, one hard and horny in its texture, the other soft and elastic. In the case of the former, the C. is mixed with about one third of its weight of sulphur, and heated for several hours, the temperature finally rising to fully 300° F. For the soft kind of vulcanized rubber, on the other hand, a much smaller proportion of sulphur is required—namely, from 2½ to 10 per cent, and the heat to which it is subjected in the vulcanizing chamber is considerably less. Usually, too, with this latter kind, the articles are made before the rubber is heated. The sulphur is commonly added in the ground state, but sometimes the rubber is treated with some solution containing this element. such as the bisulphide of carbon

Although sulphur is the only essential ingredient required for vulcanizing rubber, yet other substances are usually added. Thus, in the case of machinery belting, pipes, and some other articles, the silicate of magnesia (French chalk) is used to prevent adhesiveness. Litharge, or carbonate of lead, again, is frequently mixed with the rubber and sulphur for certain purposes; but there is really a long list of materials more or less used in preparing different qualities of vulcanized C., each manufacturer using mixtures, the exact nature of which he is careful not to divulge. Asphalte, tar, lamp-black, whiting, rosin, sulphide of antimony, and ground cork are some of the ingredients most commonly employed in this way. Belting for machinery, and some kinds of tubing, are formed of alternate layers of canvas and vulcanized rubber

Natural C., as already stated, is elastic, cohesive, impervious to gases, insoluble in water, and resists many chemical re-agents; but it loses its elasticity by cold, softens by heat, and is destroyed by many fixed oils. After being vulcanized, C. has its elasticity greatly increased, is not hardened by cold, and does not soften or become viscid at any temperature short of its absolute decomposition. Besides, it is barely soluble in turpentine, naphtha, and the other solvents of pure C.; nor does oil readily penetrate or soften it.

It would be a hopeless task to attempt to specify the many useful purposes to which vulcanized C. is applied, even if we had the space to spare. From the year 1843, when it was first made, to the present time, the various patented applications of it must be two or three thousand in number. The mere abridgments of the specifications connected with this material, issued by the English patent office, form a thick volume. Under the head GOLOSHES, will be found a brief description of the process of making india-rubber shoes. Water-proof coats are now made in a similar way, the mixture of rubber and vulcanizing materials being pressed on the surface of any suitably woven fabric by heated iron rollers in a calender. The coats are then cut out and the various pieces put together, without sewing, by some solvent, such as turpentine, which makes the edges adhere. They are afterwards heated in the vulcanizing chamber. Both coats and shoes of this material have, however, the objectionable property of preventing the escape of moisture from the skin. Belting, buffers, wheel tires, washers, valves, pipes, fire-hose, and other engineering appliances, form a large branch of the rubber trade. For medical and surgical purposes, many articles are made of this material. Of such an

apparently trivial matter as vulcanized rubber thread, one English firm turns out about 3,000 lbs. per day, and another single small article—namely, tobacco pouches—is made in another factory at the rate of 3,000 per diem.

Hard vulcanized rubber, termed vulcanite, and sometimes ebonite, is made into a great many small articles, such as combs, chains, bracelets, boxes, penholders, paper-knives, knife-handles, buttons, etc., as a substitute for materials like horn, bone, ivory, and jet. As in the case of these substances, it is formed into various objects by molding, cutting, carving, polishing, and other processes. Vast numbers of these articles are now sold, but some time must yet elapse before the quality of this material is thoroughly tested. The black color of vulcanite ornaments has still a tendency to turn gray, but the brittleness which was a fault of combs made of it a few years ago, seems to be overcome. With respect to objects of considerable size, vulcanite has been made into furniture, ornamental tiles, and even rails for railroads. A kind of vulcanite is now very largely employed as an insulator in electric cables, experience having shown that there are certain objections to gutta-percha being used for this purpose.

There are some useful applications of india-rubber in the liquid or semi-liquid state, which it is worth while to note; thus, when melted at 398° F., and mixed with half its weight of slaked lime, it forms a useful cement or lute, which can be easily loosened, but it will dry and harden if red lead is added. A very tenacious glue is formed by heating C., coal tar, and shell-lac together. It forms an ingredient in some special kinds of varnishes, and it also improves the lubricating qualities of mineral oils, when a small quantity is dissolved in them.

In Great Britain there are six or eight large india-rubber factories, each employing from 400 to 600 hands, besides a great number of smaller works. The manufacture of C. is also an extensive industry in the United States, and in some continental countries, especially France. According to an estimate made by M. Ballard in 1867, the annual French consumpt of raw india-rubber was then 180,000 lbs., the value of which in a manufactured state was fully £3,000,000. This would indicate that the industry is more largely developed in France than in England. In most india-rubber factories a large number of the work-people are females; and with respect to the operatives engaged in them generally, there is this peculiarity, that as no great skill is required on their part, employment in such works has proved quite a boon to many persons who have never learned a trade. See *Supp.*, page 889.

CAP, in ship-building, is a strong, thick block of wood fixed near the top of each mast; it has a hole to receive the upper end of the lower mast, and another to receive the lower end of the topmast, with eyebolts to aid in hoisting the topmast. There is also a C. of smaller size at the point of junction between the topmast and the top-gallant-mast. When made of iron, the C. is called a *crance.*

CAP. See PERCUSSION CAPS.

CAPACITY, LEGAL, is such a condition of individuals, in regard to their natural qualities and actual position under the constitution of the country, as fits them for the application of the laws civil and criminal. Generally speaking, all persons have this legal capacity excepting *aliens,* persons *attainted, convicts, insane* persons, and to some extent also *infants, femmes coverts* or married women, and persons under *duress;* see these heads. See also CONVEYANCE, CONTRACT, PLAINTIFF, PURSUER, DEFENDANT, SUIT.

CAPANNORI, a city of Italy, 5 m. e. of Lucca; situated in a fertile plain, on the railroad from Pisa to Florence; pop. '71, 48,313.

CAP-Á-PIE' (Fr. head to foot), in the military language of the middle ages, was applied to a knight or soldier armed at all points, or from head to foot, with armor for defense and weapons for attack.

CAPAR'ISONED, in heraldry. A war-horse completely furnished for the field is said to be caparisoned.

CAPE, in geography, the extremity of a portion of land projecting into the sea beyond the general line of the shore. On a low sandy coast, a C. generally forms an obtuse angle, being merely a change in the trending of the land. On rocky shores, capes usually form acute angles, and are here sometimes called points or promontories.

CAPE AGULHAS. See AGULHAS, *ante.*

CAPE ANN, in n. e. Massachusetts, 31 m. from Boston; 42° 38′ n., 70° 35′ w.; has two fixed lights 90 feet above tide, and about half a mile apart. There are two other lights on Thatcher's island, about a mile off shore. There are valuable stone-quarries at the cape. The whole rocky peninsula generally included under this name, projects about 20 m. into the Atlantic ocean. The s. and e. shores have many attractive summer resorts.

CAPE BAB-EL-MANDEB. See BAB-EL-MANDEB, *ante.*

CAPE BIANCO, the most northerly point of Africa, on the Mediterranean; 37° 20′ n., 9° 48′ east.

CAPE BLANCO, or ORFORD, in s.w. Oregon, 42° 45′ n., 125° 45′ w.; 25 m. from the mouth of the Rogue river. A little s. of the cape is Port Orford; on the cape is a light 125 ft. above tide.

CAPE BLANCO, on the w. coast of Africa. See BLANCO, *ante.*

CAPE BOE'O, the w. point of Sicily, a mile from Marsala; 37° 28′ n., 12° 25′ east. Off this cape, in 241 B.C., the Romans gained a naval victory over the Carthaginians, closing the first Punic war.

CAPE BOJADOR'. See BOJADOR, *ante.*

CAPE BON, or RAS ADDER, in Tunis, Africa, 37° 6′ n., 11° 3′ e., at the entrance of the gulf of Tunis.

CAPE BRET'ON, a rocky island of irregular form in British North America, stretching in n. lat. between 45° and 47°, and in w. long. between 60° and 61° 30′. It is separated from the peninsula of Nova Scotia by Chebucto or Chedabucto bay and the gut of Canso, contains 3,120 sq.m., with a pop. (1881) of 31,258. Its principal exports are pine, oak, birch, maple, fish, and coal. Though the island produces maize and other grains, yet it depends for its breadstuffs chiefly on the United States. C. B., originally a French possession, was taken by the English in 1745; but being subsequently restored to France, it was again captured in 1758, and ceded in 1763. After having been for a time a distinct colony, it now forms part of the province of Nova Scotia. The towns are Sydney, Arichat, and Port Hood, the once famous Louisbourg, stripped of its fortifications, having become merely a village.

CAPE BRET'ON, a co. in e. Nova Scotia, a part of the island of the same name, nearly surrounded by the ocean; pop. '81, 31,258. Coal is the chief production. Chief town, Sydney.

CAPE CANAV'ERAL, about the middle of the Atlantic coast of Florida, 28° 27′ n., 80° 33′ west. It has a revolving light 139 ft. above the water. There are dangerous shoals around the cape.

CAPE CHARLES, at the n.e. entrance of Chesapeake bay, Virginia. On Smith's island there is a revolving light 37° 3′ n., 76° 2′ west. This cape is the extreme s. projection of the "eastern shore" of Maryland.

CAPE CLEAR, a high promontory on the s. side of Clear island, co. Cork, Ireland, usually the first land seen when steamers are approaching England from America. There are two lights, one in 51° 26′ n., 9° 29′ w.; and one on Fastnett rock, 3½ m. n.w. by s. from the cape, 148 ft. above high water.

CAPE COAST CASTLE, the chief settlement of Great Britain in north or upper Guinea, lat. 5° 5′ n., and long. 1° 13′ west. The place, as its name implies, is defended by a fort, or rather by three forts. It has a pop. of 10,000. During 1871, the external trade of the entire Gold Coast, C. C. C. being the capital, was as follows: imports, £364,672; exports, £327,012. Under the latter head, the principal articles were palm-oil, gold-dust, tortoise shell, and maize.

CAPE COD, properly a narrow peninsula of Massachusetts, which, with a length of 65 m., forms the s.e. boundary of the great bay of that state. The northern extremity, marked by a revolving light 155 ft. high above the level of the sea, is in lat. 42° 3′ 40″ n., and long. 70° 14′ 48″ west.

CAPE COD (*ante*), the n.w. point of the long sandy strip running around Cape Cod bay and forming Barnstable co., Mass., inclosing Provincetown and Cape Cod harbors. The name is applied also to the whole strip of land. On Race point, at the n. extremity, there is a revolving light 155 ft. above tide, in 42° 4′ n., 70° 15′ west. There are also several other lights. The cape was discovered by Gosnold 18 years before the arrival of the pilgrims.

CAPE COLONY. See CAPE OF GOOD HOPE, *ante.*

CAPE COM'ORIN. See COMORIN, *ante.*

CAPE DIAMOND, the high rock at the junction of the St. Lawrence and the St. Charles on which stands the citadel of Quebec.

CAPE DISAPPOINTMENT, or CAPE HANCOCK, the s.w. point of Washington territory, at the entrance of Columbia river; 46° 16′ n., 124° 2′ w.; has a white light 232 ft. above the water.

CAPE DUCA'TO. See DUCATO, *ante.*

CAPE ELIZABETH, in the town of that name in Cumberland co., Me., 6 m. s.e. of Portland, 43° 33′ n., 70° 11′ w. There are two lights, one fixed and one floating. The town is a suburb of Portland, and a popular summer resort; pop. '80, 5,302.

CAPE FAREWELL, the s. point of Greenland, a precipitous headland on an island; 59° 49′ n., 43° 54′ w. The currents, the ice, and the winds combine to make this probably the most boisterous point on the globe.

CAPE FEAR, the s. point of Smith's island at the mouth of Cape Fear river in North Carolina; 33° 48′ n., 77° 57′ w. There is a light about a mile from the shore.

CAPE FEAR RIVER, in North Carolina, formed by the Haw and Deep rivers, and affording navigation from the ocean to Wilmington, and further for steamboats. It enters the Atlantic n. of Smelt island.

CAPEFIGUE, Baptiste Honoré Raymond, a French publicist and historian, was b., 1801, at Marseilles. He studied law at Aix, and in 1821 proceeded to Paris, for the purpose of completing his juridical course, but soon betook himself to journalism and authorship. He held a post in the foreign office until 1848. This, however, did not interfere with his amazing activity. Besides contributing extensively to many of the Parisian journals, C. also "manufactured" not less than a hundred volumes of history—not, indeed, intrinsically valuable, but indicating wonderful facility in the use of the pen. The best is the *Histoire de la Restauration* (3d edit., 1842). C. also published of late years many interesting biographical works. He d. 1882

CAPE FINISTERRE'. See Finisterre, *ante.*

CAPE FLATTERY, the extreme w. point of the United States (except Alaska), in Washington territory, s. of the strait of Juan de Fuca. On an island half a mile from the cape is a light, 48° 20′ n., 124° 43′ 48″ west.

CAPE FLORIDA, the s. extremity of Key Biscayne in Dade co., Fla., e. of the Everglades. There is a fixed white light.

CAPE GATA, or Cape de Gatte, a promontory of Spain in the province of Granada extending into the Mediterranean; a mass of rock about 24 m. in circumference. The most notable of the pile is the ancient Promitorium Charidemi, the Moorish Kheyran, and is formed chiefly of agates, spars, and crystals. The cape was once a resort of Moorish pirates.

CAPE GIRARDEAU, a co. in s.e. Missouri, on the Mississippi and the St. Louis and Iron Mountain railroads. It is level, fertile, and well cultivated; producing wheat, corn, oats, potatoes, tobacco, etc.; 875 sq.m.; pop. '80, 20,998—1994 colored. Co. seat, Jackson.

CAPE GIRARDEAU, a city in the co. of the same name in Missouri on the Mississippi river, 100 m. below St. Louis; pop. '80, 3,889. It is in a rich and well cultivated section. St. Vincent's college, Roman Catholic, is the principal public institution.

CAPE GUARDAFUI'. See Guardafui, *ante.*

CAPE HATTERAS, a dangerously low point of North Carolina, U. S., in lat. 35° 14′ n., and long. 75° 30′ w. It forms the eastern extremity of the insular banks of the same name, projecting virtually into the Florida stream, and marking the spot where the coast-line abruptly turns from the direction of n.e. to that of due north.

CAPE HATTERAS (*ante*), the point of the coast of North Carolina stretching furthest into the Atlantic, and by far the most dangerous part of the American coast for navigators, on account of shoals and frequent gales and storms. Coasting vessels are apt to be crowded up towards this cape by the gulf stream, which is only about 20 m. east. There is a light near the cape 192 ft. above the sea. Cape Hatteras is off about the middle of Pamlico sound, and is one of the most desolate and barren regions on the U. S. coast.

CAPE HAYTIËN (formerly called *Cape Français* and *Cape Henri*), a seaport t. of the island of Hayti, on its n. coast, in lat. 19° 40′ n., long. 72° 54′ west. It is pleasantly situated on a small bay, partly encircled by hills, has wide and well-paved streets, and some handsome squares. A great portion of it, however, is in ruins, the effects of the revolutionary wars at the end of last century. Safe anchorage is found within the harbor, which, however, is rather difficult of access. C. H. carries on a considerable trade with the United States. Pop. stated at from 12,000 to 16,000.

CAPE HENLO'PEN, on the e. coast of Delaware, at the s. entrance of the Delaware bay, 13 m. s.s.w. of cape May, which is in New Jersey, on the other side of the entrance. Cape Henlopen is in 38° 47′ n., 75° 5′ w., and has a fixed light 182 ft. above the sea.

CAPE HENRY, on the coast of Virginia, at the s. entrance to Chesapeake bay, opposite to cape Charles in Maryland; 36° 56′ n., 76° 4′ w.; has a fixed light 120 ft. above the sea.

CAPE HORN, or Hoorn, the most southerly point of America, terminating an island of its own name, in the archipelago of Terra del Fuego. It is in lat. 55° 58′ 40″ s., and long. 67° 16′ w., having a perennially antarctic climate, and being in itself merely a detached link, bare and rugged, of the chain of the Andes. It was discovered by Schouten, a native of Hoorn in Holland, about 90 years later than the strait of Magellan, and since then the course of navigation of sailing vessels has been round the cape instead of through the strait.

CAP'EL, Arthur, Lord, 1600–49; representative of Hertford, in the Long parliament of 1640. He was a royalist officer, acting with lord Colchester and Edward Hyde as a general, and was in the actions of Bristol, Exeter, and Taunton. At Colchester,

he was compelled by famine to surrender to Fairfax. He was tried for treason and executed Mar. 9, 1649. He was the author of *Daily Observations or Meditations.*

*CAP'EL, Thomas John, b. 1835; an English Roman Catholic priest. When but 17 years old, he, with others, founded a normal training college for the edueation of school-teachers, of which, in 1856, he was made vice-principal. Being compelled to seek southern Europe on aceount of ill health, he founded at Pau a mission for English-speaking Roman Catholies, in eonsequenee of whieh the pope advaneed him to "monsignore," a position equivalent to that of bishop. Returning to England, in 1873 he established the Roman Catholic publie-school at Kensington, and devoted much of his time to preaching. In 1874, he published a *Reply to Gladstone's Political Expostulation.*
See *Supp.*, page 889.

CAPE LA HAGUE, a promontory of France, forming the n.w. extremity of the peninsula of Cotentin, in the department of Manehe. It juts out into the English ehannel, opposite the island of Alderney, and about 16 m. n.n.w. of Cherbourg, and 50 m. s. of St. Alban's Head, in Dorsetshire.

CAPE LA HOGUE, often confounded with cape la Hague, is situated on the e. side of the same peninsula. Here the united English and Dutch fleets defeated the French in 1692.

CA'PELIN, *Mallotus Grœnlandicus,* a small fish of the family of *salmonidæ,* extremely abundant on the coasts of Newfoundland, and mueh used as bait in the eod-fishery. It is also, in a dry state, an article of commerce, and is imported, although not very largely, into Britain, where it sometimes appears on the breakfast or supper table. Its flavor, which is very agreeable, suggests to most persons the idea of its belonging to the herring rather than the salmon family. It is nearly allied to the smelt, but the teeth are smaller and more numerous. It is the only known species of its genus.—Shoals of eapelins arrive periodically on the coast of Newfoundland, the vast numbers changing the very color of the sea.

CAP'ELL, Edward, 1713–81; b. in Suffolk, England; a Shakespearean annotator and critic. As deputy-inspector of plays, he beeame so much disturbed by the inaecuracies in the current edition of Shakespeare, that he projected an entirely new print, carefully compared with the original as far as possible. This was published at the expense of the London book-sellers. He eontinued his Shakespearean researches during his life, and shed much light on the great author's works. He also published a volume of ancient poems under the title of *Prolusions.*

CAPELLA, a bright star of the first magnitude, on the left shoulder of Auriga. C. is also called Capra or the *She-goat,* a name also sometimes given to Capricorn.—The poets fable C. to be Amalthea's goat, which suckled Jupiter in his infancy.

CAPELLA. See A Capella.

CAPELLA, Martianus Mineus Felix, a learned author belonging to the second half of the 5th e., was born in Africa, but where is not definitely aseertained. Of his life nothing whatever is known. The work which has preserved his name to posterity is the *Satiricon,* a kind of encyclopædia, highly esteemed during the middle ages as a work of reference. It is written in a medley of prose and verse, and is full of eurious learning, but possesses no literary value; the style has all the bombastic pomp of the Afriean sehool of later Latinists. It consists of nine books. The first two consist of an allegory, *The Nuptials of Philology and Mercury,* while the remaining seven are devoted to the "liberal arts," grammar, dialectics, rhetoric, geometry, arithmetic, astronomy, and musie. The first edition of the *Satiricon* appeared in 1499, under the eare of Franciscus Bodianus; the best in 1836, under the care of U. F. Kopp.

The book on astronomy is remarkable as containing a hint of the true theory of the solar system. Mercury and Venus are there declared to move round the *sun,* and not round the *earth;* and their relation to these bodies is properly explained. Now as Copernicus knew C., and quotes from him, it is not unlikely that he derived the first idea of his doctrine from this writer.

CAPE LOOKOUT, on the e. coast of North Carolina, 85 m. s.w. of cape Hatteras; 34° 7′ n., 76° 33′ w., having a fixed white light 100 ft. above tide.

CAPE MATAPAN′, the s. extremity of the continent of Europe, in Greece, between the gulf of Laconia and Kalamatia, 36° 23′ n., 22° 29′ east. The ancient Greeks called it Tænarium, and made it sacred to Neptune, whose temple stood near the eape, the remains of which are yet to be seen.

CAPE MAY, the s. point of New Jersey, at the n.e. entrance to Delaware bay. There is a revolving light 152 ft. above tide; 38° 56′ n., 74° 57′ west.

CAPE MAY, a co. in s. New Jersey, on the ocean and Delaware bay, intersected by the Cape May and Millville railroad; 250 sq.m.; pop. '80, 9765. The surface is level, and somewhat swampy, with alluvial soil, producing grain, hay, and fruit. In one of the swamps is a deposit of cedar trees, the timber of which is still good, though it must have been under-ground more than 2000 years. Co. seat, Cape May Court-house.

CAPE MAY, or CAPE ISLAND, a t., village, and celebrated watering place, in Cape May co., N. J.; connected with Philadelphia by railroad; sometimes called Cape city or Cape Island city. There is a fine beach several miles long, and the bathing facilities are of the first order. The hotels are numerous, and of modern construction, and in summer the place is the favorite resort of Philadelphians as well as of people from cities more remote. The climate is usually equable and pleasant.

CAPE MENDOCI'NO, in Humboldt co., Cal., the extreme w. point of the state; 40° 26′ 24″ n., 124° 23′ 27″ west. There is a flashing light 428 ft. above the water.

CAPE NORTH. See MAGEROE, *ante.*

CAPE ORTEGAL', the n. extremity of Spain, projecting into the bay of Biscay in the province of Corunna; 43° 47′ n., 7° 56′ w.; on a rugged and barren coast.

CAPE OF GOOD HOPE, popularly regarded as the most southerly promontory of Africa, though it is half a degree to the n. of cape Agulhas. The latter is merely a projection on a coast-line, which diverges inconsiderably from a parallel; but the former is really the turning-point from s. to e. on the voyage from Europe to India. This celebrated promontory is in lat. 34° 22′ s., and long. 18° 29′ e., being the termination of Table mountain, which, as it recedes towards the bay of its own name, rises from the height of 1000 ft. above the sea to that of 3,582. The cape (for so it is called by way of eminence) was discovered and doubled by Diaz, a Portuguese navigator, as early as 1486—six years before Columbus, in aiming at the same goal by a different route, led the way to America. But it was only in 1497 that Vasco da Gama realized the value of Diaz's discovery, by rounding it on his adventurous voyage from Lisbon to Calicut. The result was not merely to open a new channel for the traffic of the east, but it was also to transfer trading superiority from the republics of Italy to the states of Western Europe.

CAPE OF GOOD HOPE, a British colony, was so called from the cape on its s.w. extremity. It was established by the Dutch in 1652, some attempts at a settlement having been previously made by the Portuguese. The former only intended it at first as an intermediate station between Holland and their East Indian possessions; and at first occupied only a small tract of ground on the slopes of Table mountain, with some portion of the adjoining flats; but they had in their neighborhood scattered tribes of improvident natives, singularly feeble of purpose, and incapable of organization on a large scale. The tide of immigration set in from Holland, and when the country was finally taken possession of by the British in 1806 (there having been a brief occupation of it from 1796 till 1803), the Dutch had extended their dominion as far to the e. as the mouth of the Great Fish river, and from that point in a waving line across the country to the w., a little s. of Orange river.

In entering upon the government of this large territory, the British found themselves face to face with a race of a totally different sort from that of the purposeless Hottentot —a people styled Kaffirs, mainly of Arab descent, consisting of tall, athletic, finely formed men, of warlike dispositions, with an incurable propensity to steal from any one, provided he was not of their own tribe, and particularly so if he was a foreigner. The inevitable result was a succession of wars—those, namely, of 1812, 1819. 1828, 1835–36, 1846–47, 1851–52.

Cape Colony proper is bounded on the n. by the Orange river and the Kei. But of late the area of this British possession has been greatly extended by the annexation of districts lying to the northward. Of these successive annexations the most important are that of British Kaffraria (see KAFFRARIA) in 1866; of Basuto-land, lying in the upper basin of the Orange river, in 1868; of two vast districts across the Kei called Fingo-land and Noman's-land, now called Griqua-land East (q.v.), in 1875; of Griqua-land West, in 1876; and of the Transvaal (q.v.) in 1877. The area of cape Colony proper is 181,592 sq.m., and its pop. in 1875, 496,381. The area of the whole colony, with the newly incorporated districts, is estimated at 329,495 sq.m., and its pop. at 1,142,782.

The highest range of mountains within the colony is 9,000 ft. above the sea. The mountains keep at a distance from the coast-line of from 30 to about 100 m., and receive different names on their course, such as the Stormberg, Sneeuwberg, Nieuwveld, Roggeveld, and Kamiesberg. Between this principal range and the sea on the e., there are two other ranges less continuous and regular, the intermediate one generally more distant from the first than they are from each other.

South Africa being not far from the region of the trades, s.e. winds prevail, especially in the summer time; the only other wind that may be said to blow is that from the n.w., which prevails during the colder months. But whichever of these two winds predominates—the one bearing a supply of rain from the Indian ocean, the other, if less frequent, more richly laden from a part of the Atlantic nearer the line than the country which it fertilizes—it fails to deposit its stores on the opposite side of the principal water-shed which crosses its path. Hence the curious fact of the transposition of seasons in the same latitude. As the harvest in such latitudes depends more on the supply of rain than anything else, people are reaping on the one side of the country whilst they are sowing and planting on the other. Certain parts of the country are liable to long continued droughts, because while very heavy rain-falls take place, the rain is confined to a particular part of the year. The country, however, is admirably adapted

for the storage of water. In many places one meets with the successive beds of dried-up lakes, with a narrow outlet at the lower ends, through which a periodic stream flows. By closing up this outlet, artificial lakes or dams may be formed to almost any extent, and of unlimited number; and from the steepness of the slope, the lands lower down admit easily of being laid under water.

As regards minerals, the diamond fields are in Griqualand (q.v.), till recently beyond the limits of the colony, and in the free state. In 1874, the lieutenant of West Griqualand issued an order for the better management of diggings and mines of precious stones and minerals, in which he requires that miners shall have a certificate, dealers a license, and the mines be under official inspection. This ordinance created a great outcry against it by a great body of dealers; but it seems necessary that such protection should shield the weak and the dealer who wishes to trade according to recognized law. Gold is confidently reported to have been found in the Transvaal in payable quantities; but the only mineral within the colony which has greatly added to its wealth is the rich copper ore found in Namaqualand.

There is in the colony almost a total want of navigable rivers, but the system of railways is rapidly extending. In 1880, there was a mileage of about 600 miles open for traffic, the existing lines being mainly connected with three systems—the western, starting from Cape Town; the Midland, starting from Port Elizabeth; and the North-western, also from Port Elizabeth. The railways are all the property of the government. Direct telegraphic communication with Europe was established, in 1879, by the East African submarine cable from Aden to Natal, and thence by the land lines. The shipping at Cape Town is now secure by a breakwater and docks. The same cannot be said of Port Elizabeth, East London, and the Kowie; but measures are being taken which, it is hoped, will result in making these also safe from the fierce s.e. winds.

This splendid country is at present occupied by an assemblage of very varied races. The Portuguese were the first Europeans who landed here. The Dutch are probably still the most numerous, notwithstanding the exodus to the Orange river free state, prompted by the slave question. Next in number are the English, by whom some parts of the country, particularly in the e., are occupied almost exclusively. The French are also largely represented, many refugees having settled in it subsequently to the revocation of the edict of Nantes, but they are now nearly absorbed in the Dutch population. They were at first located principally in the w., where they introduced the culture of the vine, but their names are now found in almost every part of the land. There is also a considerable importation of Germans, who have been settled on the frontiers adjoining the Kaffirs for defensive purposes. As regards the colored inhabitants, large numbers of Kaffirs have been retained in the districts which they formerly occupied, and others have come into the country as shepherds and servants. There is a large number of people of Malay origin in and around Cape Town, and in towns on the e. coast, who gain a livelihood as fishermen, porters, and the more laborious sorts of skilled labor. There are a few Mozambiqueres and Hottentots, besides a number of half-castes, to whom the name of Africander properly belongs.

The constitution of the country, after several changes, was fixed in its present form, by an act passed by the colonial legislature in 1872, which provides for responsible government. There are two elective chambers, the upper house, consisting of 21 members, 11 of whom represent the western province as one constituency, and 10 the eastern. They are presided over by the lord chief-justice. To the lower house, or house of assembly, two representatives are appointed by each division of the colony, with the exception of the Cape district, which, as being more populous, returns four. They amount in all to 68, and are presided over by a speaker of their own choice. The 16 electoral divisions into which the western and eastern provinces are each divided, are again subdivided for magisterial and fiscal purposes. The governor carries on the administration along with a ministry of 5 members—the colonial secretary, the attorney-general, the treasurer-general, the commissioner of crown lands and public works, the secretary for native affairs. The supreme court, which has its sittings in Cape Town, has two judges beside the lord chief-justice. Another court holds its sittings in Graham's Town, in which there are two judges only, but there lies an appeal to the supreme court. In other parts of the colony, justice is administered by the judges going on circuit. A colonial university has recently been founded.

Wool is the staple product of the colony; ostrich farming and the culture of the vine are carried on. The following tables show the exports and imports of the colony for recent years:

	Imports.	Exports.
1870	£2,352,043	£2,453,768
1874	5,725,412	4,468,747
1880	8,078,048	4,488,872

The Cape Colony is not exceptional in showing a decline in imports and exports in 1877; but the insecurity caused by the troubles ending in the Zulu war of 1879 has told against the prosperity of the colony. The official tables include in the returns of revenue also the loans raised by the government; the increase since 1873 is accordingly not to be regarded as normal.

	Revenue.	Expenditure.
1870	£831,211	£795,695
1873	2,078,220	2,159,658
1875	2,246,179	2,272,275
1880	3,541,720	3,742,665

CAPE PALMAS, the s. extremity of Liberia, Africa, 4° 27′ n., 7° 44′ west. This was the point at which the Maryland colony of free colored emigrants settled in 1834. The surrounding country is one of the Liberian states, and is called Maryland. There is a light-house on the cape.

CAPE PRINCE OF WALES, in Behring sea, the w. point of the mainland of Alaska, directly opposite to East cape in Siberia, the strait between the two being the narrowest water between America and Asia. The cape is a few miles s. of the Arctic circle, and terminates in a bold bluff, n. of which are dangerous shoals.

CAPE RACE, the s.e. point of Newfoundland, usually the first American land seen by steamers from England, 46° 40′ n., 52° 54′ west. There is a revolving light 180 ft. above the sea The cape terminates in a bold rough headland.

CAPERCAIL'ZIE, Capercaillie, Wood-grouse, or Cock of the Woods (*tetrao urogallus*), the largest of the gallinaceous birds of Europe. It is a species of grouse (q.v.), almost equal in size to the turkey; the male, which is the largest, sometimes weighing fifteen pounds or more. In figure and appearance, it much resembles the black-cock, but the tail of the male C. is rounded, and not forked, as in that species; and the male C. has the feathers of the head elongated. The general color of the adult male is brownish black, minutely freckled with grayish white, and with lighter brown; the quill-feathers dark brown; the tail-feathers nearly black, some of the longer tail-coverts on the sides of the tail tipped with white; the chest is of a shining dark green; there is a small scarlet patch of naked skin above the eye, and the bill is whitish. The general color of the female and of young males is dark brown, freckled with yellowish brown; the front of the neck and the chest are yellowish chestnut; and the feathers of the under parts are generally edged with white. The C. has the feet feathered to the toes, but the toes are naked. It is an inhabitant of pine-woods; feeds on berries, seeds, worms, insects, etc., and on the young shoots of the pine, greatly preferring the Scotch fir to the spruce; occasionally also eating, at least in winter, the buds of the birch and other trees. The female makes her nest on the ground, and lays from six to twelve eggs, of a pale reddish or yellowish brown, spotted with other shades of brown, and more than 2 in. long. Like the black-cock, the C. is polygamous.—The geographical distribution of the C. is very extensive: it is found on the pine-covered mountains of all parts of Europe, from Spain and Italy almost to the North cape, and is abundant in the northern parts of Asia. It was at one time found both in Scotland and Ireland, but was completely extirpated about the end of the 18th or beginning of the 19th century. Through the exertions, however, of the earl of Fife and other proprietors of great Highland estates, but particularly of the marquis of Breadalbane, it has again been restored to the forests of the Highlands of Scottand. The C. is very capable of domestication, and breeds readily, if allowed the range of a space containing a few pine-trees. It is much esteemed for the table. The market of Stockholm is well supplied with it in winter; and since the establishment of steam communication, it has been regularly brought from Scandinavia to London.

CAPE RIVER, properly *Vaunks*, taking its popular name from the proximity of its mouth to cape Gracias a Dios, on the e. reach of the Mosquito shore in Central America. After a generally n.e. course of nearly 300 m., it enters the Caribbean sea, about lat. 14° 59′ n., and long. 83° 11′ w., being navigable for a considerable distance upwards.

CAPERNAÜM, meaning "the field of repentance," or "city of comfort," was in the time of our Savior a favorite and exalted city, and one of the three which he upbraided "because they repented not." It was situated on the north-western coast of the sea of Galilee, or lake of Gennesareth. It is now a heap of ruins, extending more than a mile along the shore and back towards the mountains, so overgrown with grass and bushes, that it is difficult to move among them. C. is called by the natives of Syria Tell-hûn.

CA'PERS are the pickled flower-buds of the caper-bush (*capparis spinosa*). They have an agreeable pungency of taste, with a slight bitterness, and have long been in very general use as a condiment and ingredient of sauces, along with boiled mution and other kinds of food. They possess medicinal properties, being antiscorbutic, stimulant, and laxative. They are of a grayish green color, to improve which, however, copper is sometimes used, as in the case of gherkins and other pickles, rendering them poisonous. This can be detected by thrusting a polished iron rod into the vessel which contains the C.; the surface of the rod soon becoming coated with copper, if it is present.—The caper-bush is a native of the s. of Europe, and other countries near the Mediterranean. It is extensively cultivated in some parts of the s. of France and in Italy, but most of all in Sicily. It succeeds in the open air even at Paris, but in Britain requires the aid of artificial heat. It is a trailing, rambling shrub, loving dry places, and often growing on rocks or walls, adding a fresh charm of beauty to many an ancient

ruin. It begins to flower early in summer, and continues flowering till winter. The buds are gathered every morning, and are immediately put into vinegar and salt: at the end of the season, they are sorted according to their size and color, the greenest and least expanded being the best, and are again put into vinegar, the finest being sent to the market in bottles, the coarser in small barrels. The fruit, which is a small berry, is also pickled in the s. of Italy. The flower-buds of the caper of Mount Sinai (*capparis Sinaica*) are pickled like those of the common species; the seeds are also pickled, and are called by a name signifying mountain pepper. The fruit of *capparis aphylla* is made into a pickle in India. Species of *capparis* are numerous in India, the warm parts of America, etc. See CAPPARIDEÆ.—Various substitutes for C. are sometimes used, as the flower-buds of the marsh marigold (*caltha palustris*), those of the Indian cress (*tropæolum majus*), and those of the bean caper (*zygophyllum fabago*).

CAPERS, WILLIAM, D.D., 1790–1855; a Methodist minister of South Carolina, in early life a missionary among the Indians in Georgia. He was for several years presiding elder in Charleston, where he edited the *Wesleyan Journal*, afterwards merged in *Zion's Herald*, and still later changed to the *Christian Advocate and Journal*, of New York. In 1838, he was representative to the Wesleyan conference in England, and in 1855 was chosen professor of the evidences of Christianity in the South Carolina university. In 1846, he was elected bishop, and filled the office until his death.

CAPE SABLE, the s. point of the mainland of Florida, and the s.e. extremity of the mainland of the United States, 26° 55′ n., 81° 15′ west. The cape is occupied by fort Poinsett.

CAPE SABLE, the s. point of Nova Scotia, 43° 26′ n., 66° 38′ west. There is a light on Cape Sable island, which island has a pop. of about 600 fishermen.

CAPE SAN LUCAS, the s. point of the peninsula of Lower California, 22° 44′ n. 109° 54′ west. Directly e. across the gulf is the Mexican port and city of Mazatlan.

CAPE SAN ROQUE, in n.e. Brazil, in the province of Rio Grande, 5° 28′ s., 35° 16′ west. Behind the cape is a bay, on which is the town of St. Joseph.

CAPE SPARTIVEN'TO, in s. Italy, in the Mediterranean, 37° 57′ n., 16° 5′ east. The ancients called it "Hercules' Promontorium," and supposed it to be the most southerly point of Italy.

CAPE ST. VINCENT, a headland forming the s.w. extremity of Portugal, in lat. 37° 2′ n., long. 9° w., is celebrated on account of two naval battles in which British ships were engaged, fought off it, one in 1693, the other in 1797. In the former, admiral Rooke, who with some 20 English and Dutch men-of-war was convoying a fleet of some 400 merchantmen, was attacked off this point by the French admiral De Tourville, and after a running fight lost several ships and 80 merchantmen. In Feb. 1797, sir John Jervis, with a fleet of 15 sail, gave battle to a Spanish fleet of 27 sail of the line, and defeated them, capturing four ships and driving the rest into Cadiz bay, where they were blockaded.

CAPE ST. VINCENT, the s.w. extremity of Portugal, 37° 2′ n., 9° west. Off the cape, Feb. 14, 1797, the English admiral Jervis defeated a Spanish fleet much larger than his own.

CA'PETIAN DY'NASTY, the third Frankish dynasty, founded about the close of the 10th c., when Hugo Capet ascended the throne. The surname CAPET has been derived from *cappetus*, "a monk's hood," because, though duke of France, Hugo was also abbot of St. Martin de Tours. On the death of the last Carlovingian monarch (Louis V., surnamed *Le Fainéant*—i.e., the Slothful), Hugo, the most powerful of French vassals, seized the throne, and by moderation and prudent concessions made to the authorities of the church, as well as to his brother-nobles, who had made themselves independent, contrived to retain the power he had seized. He was crowned at Noyon, July 3, 987. In order to establish his dynasty, Hugo caused his eldest son Robert to be crowned as co-regent, 988. Capet first made Paris the capital of France. He died in 996; when his son Robert, a well-disposed but feeble ruler, ascended the throne, who died 1031, beloved by his domestics, but despised by his neighbors and vassals, forgotten by his people, and permitting all power to vanish from his hands. It was during his long lethargic reign that the towns and cities of France began to form themselves into corporations, to act in their own name, to contract obligations, and lay the foundations of middle-class freedom. In many other ways, also, the happy dissolution of royal power sowed the seeds of national prosperity. Robert's sons were Henry, who succeeded him, and Robert, ancestor of the older house of Burgundy.

Henry left two sons—Philippe I., who ascended the throne, and Hugo, who distinguished himself in the first crusade (1096), and died 1102. Philippe, under the regency of Baldwin, count of Flanders, came to the throne when only eight years old, and first really began to reign after the death of the regent (1066). He took hardly any part in the great movements and events of his times, but supported Robert, son of William the conqueror, in his rebellion against his father. Consequently, William commenced an expedition against Paris, and would probably have dethroned Philippe, but died in

1089. By his dissolute course of life, Philippe fell under a sentence of excommunication issued by pope Gregory VII. in 1094, and, after doing penance, died in 1108.

His successor, Louis VI., surnamed *Le Gros*, had, during Philippe's lifetime, been active in the support of the crown, and now extended the royal power, which had been almost entirely confined within the duchy of Paris. By bold and vigorous measures he brought everywhere his vassels into real subjection to his authority, liberated the towns from baronial oppression, partly abolished feudal bondage, and extended considerably the jurisdiction of the crown. His life was an almost incessant contest with the small and turbulent vassals who had rioted in the license afforded them by the weakness of his predecessors. He died 1137, leaving a numerous family.

As his eldest son and co-regent, Philippe, had died during the reign of Louis, his second son, Louis VII., *le Jeune*, now came to the throne, and by his marriage with Eleanor of Guienne, heiress of the duke of Aquitaine, gained a considerable accession to the power of the crown. He engaged in the second crusade, and led 100,000 men to the east; but was unsuccessful, and returned to France after an absence of two years. In 1152, he divorced his unfaithful wife Eleanor, who subsequently married Henry Plantagenet, afterwards Henry II. of England. This marriage made Henry far more powerful than the king of France, and Louis would probably have lost his crown had not the disturbances in England—the quarrels with Becket and with his own sons—proved sufficient to occupy Henry's attention. Louis le Jeune died 1180.

Philippe Auguste (q.v.), his son by a third marriage, ascended the throne ten months before his father's death, and proved himself the most able ruler of the Capetian dynasty. Against the wishes of his family, he married Isabelle of Hainault, great-granddaughter of the last of the Carlovingians, and thus finally united the two houses. His successor, Louis VIII., who died 1226, was said to have been poisoned by the count of Champagne, paramour of the queen, Blanca of Castile. Louis VIII. was followed by his son, Louis IX. (Saint Louis, q.v.), who died at Tunis, 1270. Of the eleven children of St. Louis, the eldest, Louis, died aged 16 years, while the youngest, Robert, became the founder of the Bourbon dynasty (see Bourbon). The second son, Philippe III., *le hardi*, succeeded his father, and, by the decease of two brothers and two uncles, acquired possession of Poitou, Auvergne, and Toulouse. His son (Philippe IV., *le bel*) acquired by marriage Champagne with Navarre. These acquisitions, and his attempt to secure for his uncle, Charles of Anjou, the throne of Naples, involved Philippe III. in contentions with Italy and Spain. He subjugated Navarre, 1276, and died of the plague in 1285. Philippe IV., *le bel*, succeeded to the throne when 17 years old. He soon gave signs of a despotic character, plundered the estates of the church, defied papal authority, persecuted the order of Templars (q.v.), and removed the residence of the pope to Avignon. The atrocious act of burning the grand-master, with sixty knights, of the order of Templars, after they had recalled all the confessions drawn from them by torture, has left an ineffaceable blot on the name of Philippe le bel. He died 1314, and left three sons and a daughter.

The eldest son, Louis X., *le hutin*, who ascended the throne, displayed remarkable weakness of character, and died 1316. He was succeeded by Philippe V., *le long*, second son of Philippe le bel, who died without issue. By his death (1322) the crown came to Charles IV., *le bel*, third son of Philippe le bel, and the last of the direct line of the Capetian kings. He died 1328, leaving by his third marriage a daughter, named Blanche, who married Philippe, duke of Orleans, and died (1392) leaving no issue. Isabelle (daughter of Philippe le bel) married Edward II. of England, and was mother of Edward III., who consequently took the title of king of France, which was retained by the kings of England until the reign of George III.; but Philippe of Valois, cousin of the last Capetian king, and grandson of Philippe III., *le hardi*, claimed the crown of France by virtue of the Salic law, and so founded the dynasty of Valois (q.v.).

CAPE TITMOUSE, *Rarus capeusis*, a small bird of the cape of Good Hope, remarkable for its curious nest, which is built of cotton or other fiber in the form of a bottle, and suspended from the limb of a tree. On the outside, near the opening, is built a pouch or pocket, in which the male bird rests while the female is on the nest, and when she leaves he manages by strokes of his wings to close the mouth of the nest, to prevent intrusion while they are in search of food.

CAPERTON, Allen Taylor. See page 889.

CAPE TOWN, the capital of Cape Colony, faces Table bay to the n.e., is flanked by the mountain Lion's Head, with its continuation to Lion's Rump or Signal hill, and has behind it the precipices of Table mountain. Its lat. is 33° 56′ s., its long. 18° 28′ 7″ east. Its mean temperature 58.3° F. for winter, 76.6° for summer, and 67.3° for the whole year. Pop. 40,000. Two lines of passenger wagons connect it with the diamond fields, which are reached in about a week, railways with Worcester, etc., and electric telegraphs with the principal parts of the colony. It is the principal port for the coasting trade as well as foreign exports and imports; is well supplied with fish, as well as meat, dairy produce, and every sort of fruit and vegetables, at a moderate price. It has a supply of fresh water of excellent quality. C. T. is the seat of the government, the supreme court, and a college and university. All the churches are well represented—the English Episcopal, the Roman Catholic, and representatives of Presbyterians, Lutherans, Wesleyans, Congregationalists, a Free church (chiefly an off-break from the Dutch church), a Jewish

synagogue, and a Mohammedan mosque, the Malay population being of that faith. There are also banks and insurance offices. The town is built upon a double slope, which subsides into a plain on the n.e. side. Its streets, at right angles to each other, are lined with houses, for the most part of an eastern type, with heavy walls, flat roofs, and large public apartments, interspersed with increasing numbers of shops and warehouses, of the sort to be met with in England.

The most remarkable structures are the breakwater, with the docks and patent slip; the castle, with its outworks and bastions; the barracks for the military, the Roman Catholic cathedral, with a few other places of worship; the museum and library, with the Botanic gardens in front; and between it and Government house, a park, with its avenues shaded by stately oaks. Out of town, a little distance to the n.w., is Somerset hospital, and the Royal observatory, about two and a half m. to the n.e.

C. T. returns four members to the colonial assembly. The municipality is administered by a town-council of 18 members—three from each of six separate districts—and is presided over by a mayor elected annually by the council. In Sept., 1872, it possessed 44 vessels, and their united tonnage was 4,416. There are 5 newspapers in C. T., which are issued three times a week; 2 bi-weeklies, 1 weekly, 1 fortnightly, and 3 monthly magazines.

CAPE TRAFALGAR'. See TRAFALGAR, *ante*.

CAPE VERD, the most westerly headland in Africa, jutting out into the Atlantic ocean, between the rivers Gambia and Senegal, in lat. 14° 43′ n., long. 17° 34′ west. It was discovered by the Portuguese about 1445, and is said to have derived its name from a group of gigantic baobab trees which adorns its summit.

CAPE VERD ISLANDS (*Ilhas Verdes*), a group of islands belonging to Portugal, lying in lat. 14° 45′ to 17° 19′ n., and long. 22°45′ to 25° 25′ w., and distant about 320 m. w. of the cape from which they take their name. The principal islands are ten—viz., Santiago, the largest and most important, Fogo, Brava, Maio, Boavista, San Nicolâo, San Antonio, San Vicente, San Luzia, and Sal. There are besides four islets, barren and uninhabited. The total area is about 1700 sq.m., with a pop. (1882) of 100,000. The islands are all very mountainous, and owe their origin to the action of submarine volcanoes. The highest elevation is reached in a volcanic peak, 9,157 ft. above the sea, on the island of Fogo, and which is still active. The climate is unhealthy during the rainy season. Though water is deficient, vegetation is luxuriant, yielding African and southern European products. Sugar, cotton, coffee, tobacco, and indigo are grown, and the trade in archil, monopolized by government, has in some seasons yielded as much as £24,000. Several of the European domestic animals thrive well. Turtles are abundant in the surrounding seas, and whales also are fished by British and American vessels. Amber is found on the coasts, and great quantities of salt formed by solar evaporation is obtained from the lagunes on the shores, especially on the island of Sal. The inhabitants, who are mostly negroes, indolent but harmless, speak a corrupted form of Portuguese, called Lingua Creoula. The revenue for 1874–75 was estimated at about £43,000, and the expenditure for the same year at £42,000. The islands are under a governor-general, exercising both civil and military authority. The chief ports are Porto Praya, on the island of Santiago, and Porto Grande, the best harbor in the whole group, on the island of San Vicente. The islands were discovered about the middle of the 15th c. by the Portuguese, who shortly after colonized them.

CAPE VINCENT, a t. in Jefferson co., N. Y., on the St. Lawrence river; pop. of township, '80, 3,143. The village is a port of entry; is in connection with Watertown by railroad, and with Kingston, Canada, by ferry.

CAPE WRATH, a pyramidal promontory of unrivaled wildness and grandeur, forming the n.w. extremity of Scotland and of Sutherland, and running out into the Atlantic, in lat. 58° 38′ n., and long. 4° 58′ 5″ west. It consists of gneiss, with beds of dark hornblende rock, is intersected by complex granite veins, and presents deep fissures and tall pinnacles. From it a reef of rocks, perforated with arches and caverns, juts out into the sea. Off the cape is Stag Rock, a pillar 200 ft. high. C. W. is 600 ft. high, and there is a light-house near it, 400 ft. above the sea, and seen 25 m. off. From the cape can be seen N. Rona, 50 m. off; Hoy Head, Orkney; the Butt of Lewis; and a grand panorama of mountains in Sutherland.

CA'PIAS, in the practice of the English common law, is a writ directed against the person, and so called from the commencement of the process in the old Latin form. It has various applications, the principal of which are the following:

CAPIAS AD RESPONDENDUM is a writ which a plaintiff, after action, may sue out upon affidavit against a defendant who, there is reason to believe, is about to quit England, and against whom there is a cause of action to the amount of £50 or upwards, whether as matter of contract or of damage. The writ directs the sheriff to arrest the defendant, who remains in custody on such arrest until he shall have either given a bail-bond with reasonable sureties. This arrest is only when the defendant's absence will prejudice plaintiff.

CAPIAS AD SATISFACIENDUM, or CA. SA. This is one of the writs by which a plaintiff can put a judgment recovered by him in execution. The object of it is to imprison

the debtor till satisfaction, when imprisonment is still permitted. See on the subject of Capias generally, APPREHEND, ARREST, ATTACHMENT, EXECUTION, and BAIL.

CAPILLAIRE', a medicinal syrup, used as a pectoral in chronic catarrhs, is prepared by adding sugar and orange-flower water to an infusion of the fern called maidenhair (q.v.), or by pouring boiling syrup on the fern.

CAP'ILLARIES. The tubes which convey the blood from the left side of the heart to the various parts of the body are termed arteries, while those which return it to the right side of the heart, after it has discharged its various functions in the body, are known as veins. The name of capillary (from *capilla*, a hair) is given to the minute vessels which form the connection between the terminal branches of the arteries and the commencements of the trunks of the veins. These little vessels are of various sizes, some admitting only one blood-corpuscle at once, while others are large enough to allow of the simultaneous passage of two, three, or more corpuscles. In the muscular tissue their average diameter is 0.003 of a line; they are smallest in the brain, and largest in bone. Their arrangement varies in different parts. In some cases, as in muscular tissue, they run for the most part parallel to one another; in other cases (as around fat-cells) they have a spherical arrangement, and in the skin and in parts of the intestines they form loops; and many other forms of distribution might be mentioned. These various arrangements have been discovered by the microscopic examination of tissues that have been successfully injected with colored fluids.

The circulation of the blood through the C. may be readily seen in the web between the toes of the hind-foot of the frog, in the tongue of that animal, in the tail or gills of the tadpole, in the wing of the bat, etc.

The principal uses of the capillary system of vessels will be noticed in the articles on DIGESTION, NUTRITION, RESPIRATION, and SECRETION.

CAP'ILLARY AC'TION. When a clean glass tube with a fine bore, open at both ends, is plunged into a liquid capable of wetting it, such as water, the liquid is found (1) to rise in the tube above the level of its surface in the vessel containing it; (2) to rise the higher in the tube above that level the finer its bore is; (3) to stand above the general level in the tube where it approaches the sides (as in fig. 1, which is drawn on a greatly exaggerated scale), so that its upper surface in the tube is curved and concave. When a similar tube is plunged into a liquid incapable of wetting it, such as mercury, phenomena of a precisely opposite nature are presented. The liquid stands in the tube below the level of its surface in the vessel; and, where it approaches the sides of the tube, it stands below its general level in the tube, so that its upper surface is curved and convex as in fig. 2, the convexity and depression in the tube increasing with the fineness of its bore. While such is the case with the two classes of liquids described, there are others on which fine tubes have no action, so that they stand in such tubes at the same level as in the vessel, and with plane upper surfaces. These are the leading phenomena to be explained by what is called C. A., the tubes with fine hair-like bores being called capillary tubes, from Lat. *capillus*, a hair. The phenomena, however, though connected by name with such tubes, are not dependent on them, but may be produced without their intervention by any contrivance which gives room for the so-called capillary action. For instance, if two plates of glass with parallel faces be placed together with two of their edges in contact, and the two opposite be separated a very little by a fine wedge; and then if they be put standing with their common edge vertical in a trough (fig. 3), containing a little colored fluid capable of wetting the glass, the fluid will rise between the plates, the height attained at any point being inversely as the distance between the plates at that point, so that its upper surface will be a curve of the kind known as the hyperbola —being highest near the common edge, and lowest near the edges separated by the wedge. If the same apparatus be placed in a trough containing mercury, the mercury will be depressed between the plates till its upper surface forms a hyperbola convex to the zenith.

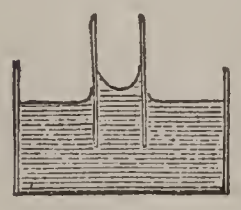


Fig. 1.

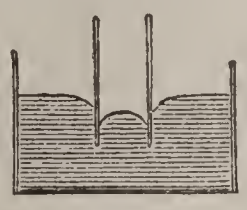


Fig. 2.

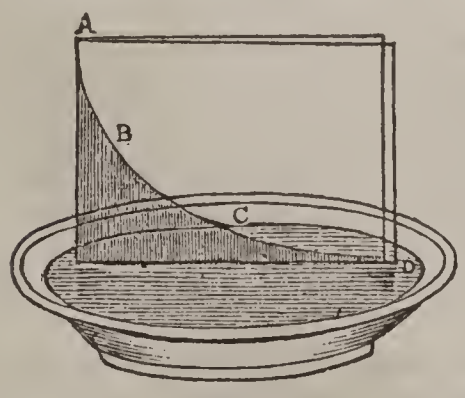


Fig. 3.

To understand the peculiar action producing these phenomena, it must be kept in view that the surface of a fluid at rest under gravity is a horizontal plane (see HYDROSTATICS), and that this plane is maintained by gravity and the mutual attractions of the particles of the fluid mass. Suppose now a fluid at rest in a vessel to have a foreign body, such as a capillary tube, suddenly plunged into it, and separating, as by walls, a portion of the fluid from the rest. By cohesion (q.v.), the fluid particles inside the tube will be held on—drawn downwards—to the mass of the fluid, while by adhesion (q.v.) they will be drawn upwards towards the sides of the tube. By the ordinary action of gravity, as in tubes of a large size, the fluid will at once tend to rise in the tube to its level in the vessel. Whether it will succeed in doing so, or whether it will rise still higher, must depend on the adjustment of the forces of cohesion between the fluid particles and their

adhesion to the solid of the tube. The relation of these forces may be generally explained as follows: Let *mm'* (fig. 4) be the surface of the column, *mn*, of a liquid contained in a space, *abb'a'*, above or below the surface, *nn'*, of the external liquid. There being equilibrium between the liquid in the tube and in the vessel, any line of liquid particles may be taken and supposed to be detached from the rest and inclosed in a tube, without altering the forces exerted. Let the line included between the dotted lines be conceived so detached. The actions which the particles of the liquid in the tube exert on each other, or sustain from the sides of the tube, have no tendency to make the liquid move either up or down. But the column, *mb*, in the tube has some action exerted on it by the sides of the tube above the surface, *mm'*. Let A, depending on the force of adhesion, represent this upward action of the tube. The column is also attracted downwards by the detached column *bc*, i.e., by the liquid in the imaginary tube. Let C, depending on the force of cohesion, represent this downward action of the liquid. Also the part *bc* of the liquid is attracted upwards by the tube *ab* by the attraction which we have represented by A. Thus the liquid column is acted on by two upward actions=2A, and a downward action, C. The whole force acting on it, excluding gravity, is 2A−C. Gravity would make the liquid rise to *nn'* at once, i.e., till it stood as high in the tube as in the vessel. Whether, then, it will rise above *nn'*, or be depressed below it, must depend on whether 2A is greater than C, equal to it, or less than it. If 2A=C, the liquid will stand in the tube at the level *nn'*, as if these forces did not act at all. If 2A be>C, then 2A−C will be an upward force, and the column will be raised above the level *nn'*. If 2A be<C, then 2A−C will be a downward force, and the column be depressed.

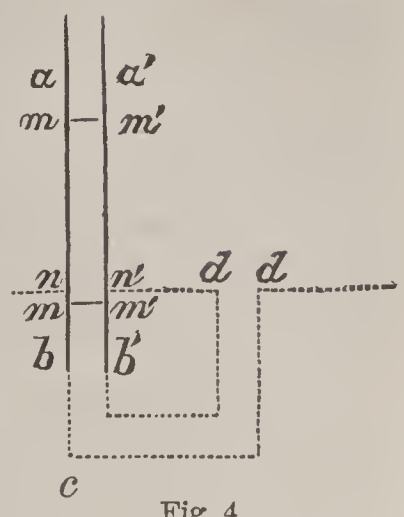


Fig. 4.

Regarding the forms of the upper surfaces of columns of liquid in capillary tubes, it can be demonstrated mathematically that the same relations of the forces of attraction and cohesion which determine the elevation or depression of the liquid column, determine also the form of its upper surface in the two cases of elevation and depression. In fact, the case of the elevated column resembles that of a cylinder of any very elastic substance (so elastic as to suffer change of form very readily under pressure), supported wholly by *the rim* at one of its ends; or, what is the same thing, by vertical forces acting in the lines composing its outer surface. Gravity draws down the concentric shells, of which the cylinder may be conceived to be composed, the further the more remote they are from the outermost, or that which is directly supported, the central rod being the most depressed. It would appear that the form of the surface has an important bearing on the cause of the production of the whole phenomena.

The third fact of observation—viz., that the liquid rises higher or is more depressed the finer the bore of the tube—is thus explained in the case of elevation: Since the action of adhesion is confined to the superficial layer of the fluid, and between the same substances is, *cæteris paribus*, constant in quantity for an equal extent of surface, the wider the tube the shorter must be the column sustained, as the contents of the column raised by cohesion increase more rapidly when the bore increases than the attracting surface. The column increases with the square of the diameter of the tube, while the attracting surface increases only with the diameter. The height, therefore, is inversely as the breadth of the tube. That the depression must increase as the bore of the tube diminishes, appears from reasoning similar to that employed in the case just discussed.

The degree of elevation varies with the nature of the fluid, the variation depending partly on the difference of cohesion between the particles of the fluid, and partly on the difference of adhesion between the fluid and glass. It is found that temperature affects these forces, so that the height diminishes as the temperature rises.

The depression of mercury in a fine glass tube makes it necessary to use a correction in reading off the height of the mercurial column in the barometer, which, owing to it, stands always a little lower than the height due to the atmospheric pressure. Experience, however, has shown that the capillary depression is nearly one-half less in tubes which have had the mercury boiled within them than in unboiled tubes, as by the boiling a film of air, which in unboiled tubes adheres to the glass, is expelled. By widening the bore of the tube also, the error may be diminished so as to be neglected altogether. In a tube of $\frac{1}{4}$ in. in diameter, in which the mercury has been boiled, the depression is 0.02 in., while with a similar tube of $\frac{1}{2}$ in. diameter it is only 0.003. The depression of mercury, it is found, is slightly increased by an elevation of temperature. It may be mentioned that in reading off the level of mercury in any instrument, such as the barometer, the height should be taken from the convexity of the curve. If the liquid used in the instrument, however, wets the tube, the height should be taken from the concavity.

As already stated, the phenomena are not dependent on the intervention of tubes; any capillary cavity suffices to produce them. When two light bodies, such as two bits of cork, are left to float on water, near each other, they soon come together, moving at last with a rush. This is sometimes given as an example of the gravitation that draws

the planets to the sun; but it is really owing to this capillary action that we are considering. When the liquid wets the floating bodies, it rises slightly all round them, and this sustained liquid hangs as a weight on them on all sides. So long as it rises equally there is no motion; but when the bodies come near each other, the space between them becomes like part of the inside of a capillary tube, the water rises higher there than on the other sides, and the bodies move towards the sides that are most strongly pulled. When the floating bodies are not wetted by the liquid, the surface between the two bodies is depressed, as that of mercury is inside a glass tube, and the bodies descend, as it were, down the opposing slopes, and meet in the bottom of the hollow. If one of two bodies floating on water is smeared with oil so as to prevent the water from adhering, instead of coming together, the two will recede from each other, for reasons analogous to the above.

C. A. plays a most important part in nature in a great variety of ways. An instance of its employment by man is seen in the wicks of lamps and candles, which, being composed of fibrous materials, furnish hair-like channels by which the melted oil is elevated to the flame, and supplied as fast as it is consumed. C. A. influences the circulation of fluids in the porous tissues of animals, and it is the principal mode in which water, with the various substances which it holds in solution, is supplied to the roots of growing plants. It is through it that in summer droughts moisture is raised to the surface for the maintenance of vegetable life. C. A., too, affects many phenomena usually considered under the head DIFFUSION (q.v.) of fluids and gases. The reader, on referring to the article OSMOTIC ACTION, will also see that it enters into the explanation of the phenomena known as exosmose and endosmose.

A familiar illustration of C. A. is furnished when one end of a towel happens to be left in a basin of water, while the other hangs over the side below the level of the water; the basin is soon emptied of its contents. It is important to observe that, although the towel will become wet, not a drop will flow from it, unless the outside end reach below the level of the water in the basin. In this respect C. A. resembles that of the siphon. And this shows the error of supposing that water may rise through the earth by C. A., and flow out as springs at a higher level than the source whence it is drawn.

Some very interesting experiments have been made by M. Poisenille (*Ann. de Chimie et de Phys.* III. xxi. 76) concerning the flow of liquids through capillary tubes, the results of which must here be stated. It appears that when the tube exceeds a certain length—which is greater as the bore increases—the following laws regulate the rate of efflux of the liquid, the efflux taking place under pressure: 1. The flow increases directly as the pressure, so that under double the pressure, double the amount is discharged in equal times. 2. In tubes of equal diameter, the quantities discharged vary inversely as the length of the tube. If a tube 2 in. long discharge 100 grains in 5 minutes, a tube 4 in. long will only discharge 50 grains. 3. In tubes of equal lengths, but different diameters, the flow is as the fourth power of the diameters. If one be $\frac{1}{50}$ of an inch in bore, and the other $\frac{1}{100}$, the efflux from the larger will be 16 times as great as from the smaller. It is further found that the efflux varies with the nature of the liquid, the material of the tube not appearing to affect the result in any great degree. No law of the rate of efflux has yet been discovered, depending on the density, capillarity, or fluidity of the fluids.

It may be mentioned, in conclusion, that the tubes to be used in the experiments on capillarity should be perfectly clean and dry. If wetted, the film of moisture on the tube forms a new tube, and the action will be the same as with a tube of the substance forming the film. The reader should consult Miller's *Elements of Chemistry*, and J. Clerk Maxwell's *Theory of Heat*, where the phenomena are treated from a different point of view; the phrases "superficial energy" and "superficial tension" being substituted for "capillarity," and the hypothesis of molecular attraction being avoided.

CAPISTRA'NO, GIOVANNI DI, 1386–1456; an Italian lawyer who became a Franciscan monk and a powerful and popular preacher. In 1450, the pope sent him to Germany to preach against the Hussites, and also to forward the projected crusade against the Turks, who threatened to overrun Europe. He failed to start the crusade, but in the siege of Belgrade he led the inhabitants with the cross in his hand in three successful sorties. He was canonized, and his tomb became a popular resort for pilgrims.

CAPITA, DISTRIBUTION PER—i.e., distribution by heads, or by numbers, equally—occurs in the case of several claimants to the property of a deceased person, all severally claiming in their own right, in equal degree of kindred, and not under any right of representation. See INHERITANCE, SUCCESSION.

CAPITAL (Lat. *capitulum*, from *caput*, the head), the head of a column, pilaster, etc. Till the period of the renaissance, the head of a column in English was called chapiter (chapter), its diminutive being chapitrell. See COLUMN.

CAPITAL, in fortification, is an imaginary line dividing a defense-work into two similar and equal parts. The C. of a bastion is a right line drawn from the point or salient angle to the middle of the gorge or entrance in the rear. The C. of a ravelin is a right line drawn from the re-entering angle of the counterscarp to the salient angle of the ravelin.

CAPITAL, in geography, the principal city or town of a country, that in which the sovereign usually resides, and where the legislature meets, and the chief legal courts are held.

CAPITAL, in trade and political economy, is in its restricted sense applied to the money, or the property convertible into money, with which a trader or producer carries on his business. In this sense, Adam Smith and many other writers call it stock; and there is a convenience in having a separate term for expressing this sense of the word C., since it is totally different from its wider sense as an element in political economy. Many attempts have been made to define C. in its general sense, but with very imperfect success, since no sooner is a restrictive definition laid down, than some one can point at things which are C., and yet are not included in the definition. It has, for instance, been called the produce of past labor stored up and applied to the facilitating of future labor; but, as we shall see, many things become C. which the hand of man has never touched. There is no doubt, however, that the existence of C. arises out of the fact of labor or industry having been exercised; and perhaps a good general understanding of its character may be derived from treating it as the *impulse* or *impetus* which past industry gives to facilitate future industry. Wherever something is reserved from immediate consumption, and made to serve in future production, there is capital. We cannot have a better illustration than in the first bow and arrow made by the savage. He has expended on this machine for securing his food a portion of the time and labor which he might have given to the tedious task of catching his food with his own hands, and at this sacrifice he has obtained the means of more easily and economically obtaining it in future. All C. is not, however, *directly* made by the industry of the owner, or, indeed, by industry at all. The accidental finder of a diamond, or a pearl, worth £100, possesses so much capital. His acquisition, however, would have no value but for those productions of industry which it is permitted to represent, and if pearls and diamonds were often found, they would cease to be valuable; the trade of finding them is as laborious and as ill remunerated in the long-run as most others. The owner of a barren heath, which was intrinsically worth nothing, finds it become suddenly valuable by the progress of a large town; but it is the industry of that town which has given the value, and the owner having the good-fortune to have a hold on a portion of the produce of that industry, becomes a capitalist. It is impossible to enumerate all the elements of which C. in the general sense consists, or all the ways in which it can be made. Whatever thing done enables some other thing to be done which supplies any of the necessities or wishes of the human race becomes capital. Thus, the education and skill of the barrister, the physician, and the artist—the agility, acquired through long and toilsome practice, of the rope-dancer and the juggler—all are capital. It makes C. to shift the place of a thing, bringing it from where it is not, to where it *is*, wanted. So, also, the changing of a person's place may become C. to him, as where he leaves a district in which his trade is not required, or exceeds the demand, for one where he can pursue it to advantage. Successful emigration thus creates C., bringing into human use districts of land which previously lay useless. The total C. at any time in existence consists of an aggregate of the several capitals at the command of individuals or communities. But it is essential to any unit of C. that it should be sufficient for the purpose it is intended for, otherwise it may seem to be, but will not in reality be, a part of the general aggregate—it will, in fact, be lost. If an expenditure of £1000 be necessary to raise a sunk ship, and only £900 are expended, that sum, which might have been available for some other purpose, is lost. C., as distinguished from property or wealth, is a *moving force;* and if it be not sufficiently strong for accomplishing its purpose, it is lost. This is one of the most important truths in all political economy, since most of the great losses suffered by communities and individuals arise from undertakings for which they have not adequate C., or for which that which seems to be C. does not really turn out to be so. Perhaps the most memorable mistake of this kind ever made was when the French revolutionary government issued assignats (q.v.). These were ostensibly issued on a good security—namely, the security of the forfeited land. But, however valuable that land might be in the long-run, it was not available to pay the assignats; there was no purchaser for it; and the assignats consequently fell in value. Gold to a far less amount than the money value of the land—that is to say, than the price which would be paid for it when sold in the natural course of things—would have been a sufficient C. for the issue of these assignats. The same mistake is often exhibited on a small scale when a landed proprietor keeps together a large estate which he cannot afford to improve and cultivate properly. It loses its power of C. in his hands; and he would be much better off if he sold a portion of it for money to be invested in improvements on the remainder. Probably 19 out of every 20 bankruptcies arise from the bankrupts having undertaken enterprises beyond the reach of their C.—from over-trading, or over-speculating, as it is otherwise called. When speculation becomes epidemic, the whole community suffers from undertakings too great for its C., and a crisis occurs. Such was the great railway crisis of 1847. Parliament had, in the previous year, passed bills for the construction of railways, which, if they had all been made, would have cost upwards of £130,000,000—a sum which the country, rich as it was, could not afford to advance. Though it is an axiom that people cannot trade beyond their C., yet what can be accomplished by any

given amount of C. must depend on the skill and sagacity of the person employing it. Competition no doubt tends to equalize profits, but competition is itself a contest in which each tries to drive a more profitable trade than his neighbors, and some are more successful than others. A frequent element of success is the rapid circulation of C., by which it is made to return many profits, though perhaps small ones, in the course of the year. The trader who turns over his C. ten times at a profit of 3 per cent, makes more than he who draws a single profit of 10.

If the nature of C., as the produce of past and the promoter of future industry, were better understood by the working-classes, they would be saved from much unhappiness and mischief. Whatever C. may be to the rich man, it is bread itself to the working family. The withdrawal of the C. embarked in the cotton trade alone would starve millions; and yet many educated men have endeavored to teach working-people that C. is their natural enemy. Its strength may no doubt be sometimes used for evil purposes, but none save evil results can arise from destroying it. The only way in which any man can effectually protect himself from such mischief as he supposes it may do, is to save, and become a participator in it. Itself the result of industry, it is a more powerful instrument in the hands of him who has made it than in any other's. The savings of working-men are the best laid out C. in the world. The first pound laid past is the most profitable of all—it represents freedom from debt, and the capacity of its owner to purchase what he wants with ready money—a privilege probably bringing him a profit of many pounds, or many hundreds per cent upon his capital.

CAPITAL ACCOUNT—such is the name given to what concerns the capital stock of a railway or other public company. In authorizing a railway company—which we take as an example—parliament gives power to raise so much money by shares, and so much by borrowing. The amount that may be borrowed is equal to a third of the share stock, but it cannot be legally borrowed until at least one half of the share stock has been paid up. The form of borrowing is that of giving a mortgage on the whole property of the railway; the deed of mortgage, which is called a debenture, expresses the sum lent, the rate of interest that is to be paid, and the period for which the loan is given. See DEBENTURE. Unitedly, the money got for shares and by debentures forms the capital of the company; and, deposited in a bank, constitutes the *capital account*. On this fund the directors of the company make draughts to pay for the land, and all the works connected with the line, as also rails, locomotives, carriages, and, in short, everything involved in perfecting the railway up to the point of working. From the first, the holders of debentures receive interest, which must be paid in all circumstances, and the principal must be returned at the conclusion of the period for which it has been borrowed; at least, such are the ordinary obligations towards debenture holders. For the share part of the capital no return is made till the railway has been in operation, and drawings come in from the traffic.

As soon as traffic commences, there begins a new account called the *revenue account*, and which, kept in the same or a different bank, has no connection with the capital account. This, it may be judged, at once introduces a great complexity into the financial affairs of railways. In ordinary businesses, the profits of a concern are the free proceeds after deducting interest on capital and all expenses; and no attempt is made to keep two accounts, or to detach one part of the revenue from the other. As shareholders in a railway occupy the position of partners in a business, it might be expected that they would receive a divisible part of the proceeds equal to their respective claims after all expenses whatsoever had been paid. This is not the plan usually adopted. In general, the shareholders are only temporary partners; they buy shares in order to sell them at an advance. What they mainly look to is the rise on shares in the market, and therefore any process of management which can promote this important object meets their approval. Hence, the keeping of two accounts, two bank pass-books, and two books of checks. From the revenue account are drawn all payments for wages, rates, and taxes, coke, oil, and other petty furnishings, also repairs on carriages and locomotives, maintenance of way, and general management. What remains is the fund, whence is paid, first, the interest on debentures, and second, the dividend of the shareholders. From the C. A. are drawn all other outlays: first, the repayment of principal to debenture holders, and, second, the expenditure for new carriages and locomotives, new rails, and other substantial repairs upon and additions to the plant. As all railway traffic exceeds the expectations formed respecting it, the demands on the C. A. for fresh additions of one kind or other become exceedingly onerous. Were the shareholders to look to ultimate advantages, they would sanction the payment for permanent improvements out of the current revenue; but, as has been stated, shareholders for the most part care nothing for the remote and contingent prosperity of the undertaking, and will not or cannot make a corresponding sacrifice. Greatly diminished by primary outlay, and now operated upon for all sorts of additions and improvements, the C. A. is at length exhausted, and new powers have to be got from parliament to create new shares and new debentures, and which shares are only taken up by being guaranteed a preferable claim on the funds of the company. Where a large extension of traffic must be provided for, the creation of fresh capital is indispensable and legitimate; but it is equally open to remark that the C. A., as usually conducted, affords the means of enormously

increasing the company's obligations, and is, in fact, an expedient to give good dividends to present holders of stock at the cost of their successors. Perceiving what must be the consequences, those among the proprietary of the small and more prudently managed railways who look to permanent investment, lose no opportunity to urge "that the C. A. shall be closed, and the whole expenditure of the company, including the payment of dividends and interests, be taken from revenue." Objections are raised to these remonstrances, sometimes on plausible, sometimes on sufficiently valid, grounds; and it may be said that in remarkably few cases have railway companies been able, or been disposed, to close their capital account. See RAILWAYS (Legislation and Management).

W. C.

CAPITAL FELONIES. See FELON.

CAPITAL PUNISHMENT in criminal jurisprudence is the punishment of death. It is called *capital* punishment because the head (Lat. *caput*), from being the most vital, is usually that part of the body which is acted on. This applies especially to beheading and hanging; but almost all modes of depriving a criminal of life appear to have in view the peculiar vulnerability, and, at the same time, vitality of the head. This extreme penalty, notwithstanding the practice of the world from the remotest times down to the present day, has frequently been reprobated by philosophers and philanthropists, who have even gone so far as to deny the right so to punish to any earthly power. The weight of authority, however, appears in favor of capital punishment. Mr. Bentham, one of the most reasonable and discriminating authorities on the subject, in his well-known and valuable treatise, says that the idea of C. P. would naturally suggest itself in the infancy of a state. When any one had committed an offense, and disturbed the peace of society, the question would then first arise: "How shall we prevent these things?" and the answer most likely to occur to a set of barbarians would be: "Extirpate the offender, and give yourself no further trouble about him." And in conformity with this view of the matter, he alludes in a note to the case of the Hottentots, who have no fixed laws to direct them in the distribution of justice, and consequently, when an offense has been committed, there is no form of trial, or proportion of punishments to offenses; but the kraal (village) is called together, the delinquent is placed in the midst, and, without further ceremony, demolished with their clubs, the chief striking the first blow. The marquis Beccaria, in his remarkable *Essay on Crimes and Punishments*, strongly argues against the capital sentence being carried out in any case, denying the right, in fact, of government so to punish, and maintaining, besides, that it is a less efficacious method of deterring others, than the continued example of a living culprit condemned, by laboring as a slave, to repair the injury he has done to society. Bentham, on the contrary, holds that death is regarded by most men as the greatest of all evils; and that especially among those who are attached to life by the ties of reputation, affection, enjoyment, hope, or fear, it appears to be a more efficacious punishment than any other. On the question of right, Beccaria is still more pointedly refuted by sir Samuel Romilly, who observed: "Beccaria and his disciples confess that it is not the greatest of evils, and recommend other punishments as being more severe and effectual, forgetting, undoubtedly, that if human tribunals have a right to inflict a severer punishment than death, they must have a right to inflict death itself" (*Memoirs*, vol. iii. p. 278). It is not a little interesting to know that such was the opinion of one who did so much as a statesman to mitigate the severity of the criminal law.

Against C. P. arguments are often urged from Scripture, based on the general principle of Christian charity. To these it is replied that they proceed on a misapprehension and misapplication of the principle; and reference is confidently made to the Old Testament as sufficiently exhibiting the mind of the great Lawgiver in regard to this matter.

Death was, in former times in England, the ordinary punishment for all felonies, and the certain doom of those who could not avail themselves of *benefit of clergy* (q.v.), i.e., the common law inflicted death on every felon *who could not read*, and the law implied that punishment, where a statute made any new offense felony. On the other hand, the numerous acts of parliament creating felonies without benefit of clergy, show that the statute law was still more sanguinary, so that of the 160 offenses referred to by Blackstone as punishable with death, four fifths had been made so during the reign of the first three Georges. That some idea may be formed of such Draconian justice as was then established, we may mention the following as among the offenses which involved sentence of death: stealing in a dwelling house to the amount of 40*s.*; stealing privately in a shop goods of the value of 5*s.*; counterfeiting the stamps that were used for the sale of *perfumery;* and doing the same with the stamps used for the certificates for *hair powder*. Thanks, however, to the exertions of sir Samuel Romilly, the inhumanity and impolicy of such a state of the criminal code gave way, towards the end of the reign of George III., to a course of legislation which has reduced the application of death as a punishment within its present humane limits. Practically, indeed, it is only in the case of treason and murder that the capital sentence is ever pronounced; and even then, it is not always carried out, for the crown reserves to itself and exercises a right of review which frequently leads to such a change in the convict's fate as at least spares his life. This discretionary control on the part of the executive is essential in

the present state of the law, which affords no means for a judicial appeal on the merits; for the very nature of the punishment, when finally executed, precludes the idea of all benefit to the sufferer, should the verdict of the jury afterwards turn out erroneous, and the innocence, instead of the guilt, of the accused be established. The law as it stands, indeed, allows a capital sentence to be reversed if technical error can be shown on the face of the judgment or other matter of record—but what avails that, after the sentence has been executed.

In Scotland, the administration of the criminal law has perhaps been, on the whole, as severe as in England. Mr. Erskine says that "those crimes that are in their consequences *most hurtful to society*, are punished capitally or by death," a category that is certainly sufficiently indefinite; and anciently, it might be shown that the executions in Scotland for offenses corresponding to those which were capitally punished in England, were, in proportion to the population, quite as numerous as those in the latter country. But in the more modern practice of Scotland, capital sentence was only pronounced in the four pleas of the crown—viz., murder, rape, robbery, and wilful fire-raising, to which may be added housebreaking. At present the penal system in Scotland may be said to be identical with that in England, death, as a punishment, being only inflicted in the case of convictions for murder.

With respect to the mode of executing C. P., we need not detain the reader by any account of the obsolete cruelties and tortures of former times. It may suffice to state that *hanging* and *beheading* are the two methods which now, for the most part, are practiced in the different European states—indeed, with the exception of Spain, by all. In the last country, the death of the culprit is instantaneously caused by the *garrotte* (q.v.). In England, Scotland, and Ireland, and in all the dependencies of the crown, the convict is hanged; while in France he is decapitated by the *guillotine* (q.v.), an instrument which an old Scotch machine called the *maiden* (q.v.), and used for the same purpose, very much resembled. In most of the German states, beheading is the mode of execution adopted; but in Austria, criminals convicted of capital offenses are hanged, as in England. See Execution.

The following works may be consulted on the subject of this article: Basil Montagu *On the Punishment of Death*, 3 vols. (1809, 1812, 1813), in which he collects the opinions of different eminent authorities; *Memoirs of Sir Samuel Romilly*, 3 vols. (1840), and his miscellaneous law pamphlets; Jeremy Bentham's *Rationale of Punishment* (1830); Beccaria's *Essay on Crimes and Punishments* (1775); Edward Gibbon Wakefield's *Facts Relating to the Punishment of Death in the Metropolis* (1831); and Frederic Hill's *Crime, its Amount, Causes, and Remedies* (1853).

Capital Punishments in the Army and Navy.—1. *In the army.*—The law on this subject is contained in the 19th of the articles of war now in force, which prescribes death as the punishment of the following offenses, or such other punishment as by a court-martial shall be awarded. (1) Any officer or soldier who shall excite or join in any mutiny or sedition in any forces belonging to her majesty's army, or royal marines, or who shall not use his utmost endeavors to suppress it, and knowing of it, shall not give immediate information of it to his commanding officer; or (2) who shall hold correspondence with, or give advice or intelligence to any rebel or enemy of her majesty; or (3) who shall treat with any rebel or enemy without her majesty's license, or license of the chief commander; or (4) shall misbehave himself before the enemy; or (5) shall shamefully abandon or deliver up any garrison, fortress, post, or guard committed to his charge; or (6) shall compel the governor or commanding officer to deliver up or abandon such place; or (7) shall induce others to misbehave before the enemy, or abandon or deliver up their posts; or (8) shall desert her majesty's service; or (9) shall leave his post before being regularly relieved, or shall sleep on his post; or (10) shall strike or offer any violence to his superior officer, being in the execution of his office, or shall disobey any lawful command of his superior officer; or (11) who, being confined in a military prison, shall offer any violence against a visitor or other his superior military officer, being in the execution of his office.

By article 20, it is declared that no judgment of death by a court-martial shall pass, unless two thirds at least of the officers present shall concur therein; and by article 21, it is provided that judgment of death may be commuted for penal servitude for any term not less than four years, or for imprisonment for such term as shall seem meet.

It would appear that the employment of a soldier in the service subsequent to his arrest on a capital charge, may operate as a remission of the sentence of death. This is illustrated by the following case, mentioned by Mr. Prendergast in his *Law Relating to Officers in the Army* (2d ed., 1855, p. 245): In 1811, private John Weblin of the 3rd buffs was sentenced to be shot. The commander-in-chief, the duke of Wellington, in his "remarks" upon the proceedings, took notice that, through some extraordinary inattention, the prisoner had actually been permitted to serve in an engagement with the enemy, after he had been put into arrest for his crime. On this ground, the duke pronounced that he was under the *necessity* of *pardoning* the prisoner.

In the army, C. P. is inflicted by the offender being either shot or hanged—the latter being the more disgraceful mode of execution.

2. *In the navy.*—These are regulated by the 22 Geo. II. c. 33, amended by the 10 and 11 Vict. c. 59. By the first of these acts, certain offenses in the navy, whether on board

ship or on shore, were punished with death absolutely, without any discretion in the court to alter or mitigate the sentence. But, by the 10 and 11 Vict., this severity is removed (excepting in the cases of murder and other unnatural offenses mentioned in the act), and courts-martial are authorized to abstain from pronouncing judgment of death, if they shall think fit, and to impose such other punishment instead as the nature and degree of the offense may deserve. In this discretionary sense, the following offenses are punishable, in the navy, with death: (1) The holding illegal correspondence with an enemy; (2) the not acquainting, within 12 hours after the opportunity to do so, the commander-in-chief, or other superior officer of the squadron, with any message from an enemy or rebel; (3) all spies bringing seducing letters from an enemy or rebel, or endeavoring to corrupt any one in the fleet to betray his trust; (4) the relieving an enemy or rebel in any way, directly or indirectly; (5) not preparing for fight when duty commands, or not making due preparations on likelihood of engagement, and not encouraging the inferior officers and men to fight courageously; (6) the treacherously or cowardly yielding or crying for quarter; (7) disobeying orders in time of action, or not using all possible endeavors to put the same effectually in execution; (8) being guilty of cowardice or neglect of duty in time of action; (9) through cowardice, negligence, or disaffection, forbearing to pursue the chase of any enemy, pirate, or rebel, beaten or flying, or not relieving or assisting a known friend in view to the utmost; (10) deserting to the enemy, or running away with any of her majesty's ships or their belongings, or any pieces to the weakening of the service, or cowardly or treacherously yielding up the same; (11) deserting simply, or enticing others so to do; (12) making, or endeavoring to make, any mutinous assembly on any pretense whatsoever; (13) uttering words of sedition or mutiny; (14) concealing traitorous or mutinous practices or designs; (15) striking a superior officer or offering any violence to him, being in execution of his office, on any pretense whatsoever; (16) unlawfully burning or setting fire to any ship, property or furniture, not then appertaining to an enemy, pirate, or rebel; (17) neglect in steering any of her majesty's ships, so that the same be stranded, split, or hazarded; (18) sleeping on watch, or negligently performing duty, or forsaking station; and (19) robbery.

It is stated by Mr. Prendergast, in the work to which we have referred (p. 244), that a sentence of death pronounced by a court-martial does not operate as an absolute dismissal from the service; for if the offender should be pardoned, he is restored to his former position.

But though a pardon operates as a restoration to the service, the greater question still remains to be judicially decided, whether a restoration to the service operates as a pardon. This question is inseparably connected with the fate of the gallant but unfortunate sir Walter Raleigh. He had been condemned to death for alleged participation in a treasonable plot to raise Arabella Stuart to the throne; and, after undergoing 13 years' imprisonment, he received from James I., by a commission under the great seal, the command of a fleet and army fitted out against the Spanish possessions in South America, with power of life and death over the king's subjects serving in the expedition. The enterprise failed; and on sir Walter's return to England, James caused his head to be struck off, according to the sentence originally pronounced. On showing cause against his execution, sir Walter pleaded that his commission was tantamount to a pardon, and quoted a case of a man who had been condemned for felony, having been pardoned on account of his subsequent service in the wars of Gascony. Lord chief-justice Montague, however, held that though an implied pardon of the kind cited might hold good in felony, that treason could only be pardoned by express words. There is the high legal authority of the late lord chancellor Campbell* for saying that the chief-justice declared and expounded the law soundly; and that in strictness sir Walter's attainder, under the former judgment, could only be done away with by letters-patent under the great seal, expressly reciting the treason, and granting a free pardon. See, on the subject of these two articles, ARTICLES OF WAR, and MUTINY ACT.

As to the mode of C. P. in the navy, the culprit, where he is an officer, is shot; where he is a common seaman, he is usually hanged at the yard-arm.

CAPITAL PUNISHMENT (*ante*) under the laws of the United States may be inflicted for treason, murder, arson, rape, piracy, robbery of the mails with jeopardy to the lives of persons in charge, rescue of a convict going to execution, burning a vessel of war, and corruptly destroying a private vessel, Until within a few years C. P. was the rule for the highest crimes in all the states, but it was abolished in Wisconsin and in Maine in 1874, and had been about that time abolished in Iowa; but in the latter state it was restored in 1878, the argument showing from the record that during its abolition crimes of violence had largely increased. Under the present law, a year must intervene between the sentence and execution, and the term may be further extended by reprieve. There is much difference of opinion as to the effect of the abolition of the death penalty, and perhaps no settled conclusion can be reached. The effect of its abolition has not thus far supplied any very strong reasons for the stand of those who would abolish it altogether. Perhaps the most notable suspension of this punishment in all history was during the war of the rebellion in the United States, when, in the face of the most pow-

* *Lives of the Chief-Justices*, vol. i. pp. 357, 358, 391.

erful, open, and dangerous treason, not one person was deliberately executed for that crime, the extreme penalty visited even upon the captured leader of the rebellion being the loss of the political (but not the personal) rights of a citizen.

CAPITALS (*majuscula*), in contradistinction to small letters (*minuscula*), are the large letters employed in writing and printing to help the eye, to relieve the uniformity of the page, to increase the facility of keeping and finding the place, to mark the beginnings of sentences, proper names, etc. Among the ancients, and during the earlier part of the middle ages, no distinction of C. and small letters was known; and after the practice had been introduced of beginning books and chapters with great letters often adorned or illustrated with much artistic ability, it was long before C. were employed in such a way as could afford much real advantage to the reader. At the present day, they are universally employed, even in the printing of Greek and Latin books. Considerable diversity has existed at different times with regard to the employment of them, the books of the 17th and 18th c. exhibiting a much greater proportion of them than those of the present day. In German books, all substantives usually begin with a capital letter; in English and French books of the present day, they in general appear only at the beginnings of sentences and of proper names. Adjectives formed from proper names, as *English*, *French*, etc., are generally begun with a capital in English books, but not in French nor in German ones.

CAPITANA'TA, or FOGGIA, a province of Italy, the *Daunia* of the ancients, is bounded n. and e. by the Adriatic, and on the s.w. by the Apennines. It stretches along the Adriatic about 70 m. in a straight line, and its average breadth is about 45 m.; but its coast-line, measuring round the great promontory of Monte Gargano, which has been called "the spur of Italy," is fully 100 m., and its breadth between the extremity of that projection and the Apennines, 75 miles. Pop. '81, 355,829. The greater part of the surface is a sandy plain sloping from the Apennines to the Adriatic, and watered only by some inconsiderable streams. The rearing and feeding of cattle form the chief occupations of the inhabitants. Wheat, wine, and fruits of various kinds are produced in quantities sufficient to admit of exportation. There are important salt-works, quarries of alabaster, and potters' clay. Foggia is the chief town.

CAPITATION, from the Latin *caput*, a head, means something applicable to all persons, or to the people by the head. A tax levied on all persons, without reference to property or other incidents, is called a C. tax, and sometimes a poll tax. The former term was often used in France for the tax better known as the *taille*, although this offensive impost was not imposed on all alike, the nobility enjoying many exemptions from it.

CAPITOL, the fortress of ancient Rome, and site of the national sanctuary the temple of Jupiter, was situated on the *Mons Capitolinus*, the smallest but most famous of the seven hills on which Rome was built. The hill itself was first termed *Mons Saturninus*, afterwards *Mons Tarpeius* and *Rupes Tarpeia*, and after the foundation of the capitol, *Mons Capitolinus*, though a particular portion of it retained its ancient name of *Rupes Tarpeia*. It was steep and abrupt in almost every part, formed a natural fortress, and was strengthened here and there by towers. The C. was founded by Tarquinius Priscus, and completed by Tarquinius Superbus, who tasked the people to work at it. The whole mount had a circumference of about 800 paces. During the civil wars under Sulla, the temple was burned (according to Tacitus, by design), and after its restoration, destroyed during the Vitellian riots. It was rebuilt by Vespasian, after whose death it was again destroyed by fire, but was once more restored by Domitian, who instituted here the capitoline games. Domitian's structure lasted to a late period of the empire. Regarding the site of the C., there has been great dispute; the German scholars, for the most part, maintaining that it occupied the s.w. summit of the hill, and the Italians, the n.e. The latter situation has the weight of probabilities in its favor. From that portion of the mount named the Tarpeian rock, state criminals were thrown down. According to the description given by Dionysius of Halicarnassus, the temple of Jupiter, with its peristyle of columns, was 200 ft. long by 185 ft. wide, and was divided into three cellæ, separated from each other by walls, and respectively dedicated to Jupiter, Juno, and Minerva. In the spacious portico, the people feasted on triumphal occasions. The scanty ruins remaining in the present day consist of a substructure of peperino or volcanic tufa, a wall of the same materials, and some remains of the s. front, together with a portion of the great flight of steps leading to the temple.

The modern C. (*Campidoglio*), built on the site, and partly on the foundation of the ancient C., was designed by Michael Angelo, but is one of his inferior works. The main entrance, however, presents a splendid view. It is used as a kind of hotel-de-ville and museum.

Besides the great temple of Jupiter, the most important structures on the Capitoline Mount were the temple of Jupiter Tonans, built by the emperor Augustus; and the magnificent *Tabularium*, containing archives, and, in connection with the Ærarium ("Treasury"), serving as a library and place for lectures, etc. The remains of this structure, built by Quintus Catulus, 73 B.C., have still an imposing aspect.—For the U. S. Capitol, see WASHINGTON.

CAP'ITOLINE GAMES, instituted 387 B.C., in commemoration of the preservation of the Roman capitol (fortress) from the Gauls. Nero revised them, modeled them after the Olympian games, and proposed to institute a new computation of time founded upon the 5-year period intervening between the celebrations.

CAP'ITOLINE HILL. See CAPITOL, *ante.*

CAPITOLI'NUS, JULIUS, a Latin historian of the 3d c., who wrote the lives of several of the Roman emperors, and was one of the authors of the *Historia Augusta.*

CAPIT'ULARIES (Lat. *capitularia*). *Capitularium* is literally a book divided into chapters; and the plural of the word was the name given to the laws issued by the kings of the first and second of the Frankish races, from Charles Martel downwards. These laws proceeded from the great assemblies of the king, nobles, and bishops, which formed the states of the kingdom, and, from their general character, were opposed to the laws issued for the separate states, which were called *leges.* They were divided into general and special C., according to the more or less general nature of the interests which they embraced, and the mode of their publication. They have by no means been all preserved. The most famous are those of Charlemagne and of St. Louis.. In 827, abbot Angesius, of Fontenelles, made a collection of the C. of Charlemagne, and of his son, Louis le Débonnaire. Other collections were made by private persons, and, in 847, one by authority of the king, but they are all very imperfect and ill arranged. After Charles the simple, in 922, no more C. were issued, and no similar laws or statutes exist from that period till the time of Louis le Gros, in 1100. The best collections are those of Baluze (Paris, 1677 and 1780), and of Pertz, in the *Monumenta Germaniæ.*

CAPITULATION, a treaty consisting of several specified conditions (Lat. *capitula,* heads). In the military sense of the word, a C. is a treaty of surrender to an enemy. When a place can no longer be defended, on account of failure of ammunition or provisions, or the progress made by the besieging-party, a white flag is commonly put up, as a sign that the besieged are willing to capitulate. According to the kind and degree of peril in which the fortress is placed, so are the terms which the governor may reasonably expect from his successful opponent. Sometimes the arms and military stores are left to the besieged, but more frequently they are taken by the besiegers, except articles of private property belonging to the officers and men. The "honors of war," the marching out with drums beating and colors flying, are usually stipulated for, unless the conqueror exacts very severe terms. The mildest form of a C. is a *convention,* agreed to when the conqueror is not strong enough to insist on stringent conditions.

CAPIZ', a t. on the island of Panay, in the Philippine archipelago. It is situated on a plain on the n. coast, near the rivers Panay, Panitan, and Ivisan, by which it is sometimes inundated during the rainy season. It is defended by a small fort, and is the residence of a Spanish alcalde. Pop. 11,000.

CAP'NOMANCY, a word formed from the Greek *capnos,* smoke, and *manteia,* divination. The ancients practiced it in two different ways—either they threw grains of jasmine or poppy on the burning coals, and watched the motions and the density of the smoke that rose from them, or they watched the smoke of sacrifices. This latter kind of C. was most generally employed, and that to which the greatest importance was attached. If the smoke was thin, and ascended in a right line, instead of being blown back by the breeze, or spreading over the altar, the augury was good. It was also believed that the inhalation of the smoke rising from the victims or from the fire which consumed them, gifted the priests with prophetic inspiration.

CA'PO D'IS'TRIA, a fortified seaport t. of Austria, situated on a rocky island in the gulf of Trieste, 8 m. s.w. of the city of Trieste. It is capital of the circle of Istria, with the peninsula of which it is connected by a stone causeway, nearly half a mile long. Its old buildings, ruinous walls, and narrow streets give the town a gloomy aspect. It has a cathedral, manufactures of leather and soap, and a trade in wine, oil, and salt. Pop. '80, 8646. In ancient times, this place was known as *Ægida,* and afterwards as *Justinopolis,* in honor of Justin II., who restored it.

CAPO D'ISTRIA, or **CAPO D'ISTRIAS,** JOHN ANTHONY, Count, president of the Greek republic from 1827 to 1831, was b. in Corfu, 1780. His family had been settled in that island since the 14th c., but originally came from the Illyrian town of Capo d'Istria (q.v.), near Trieste. He devoted himself to political life, and after having held a high position in the Ionian islands, he entered the diplomatic service of Russia. Here his diplomacy tended to the separation of Greece from Turkey. In 1827, he was elected president of Greece; and in Jan., 1828, he landed in Greece, and entered upon the duties of his office. He was a patriot, a philanthropist, and an able diplomatist, but by no means equal to the task which he now undertook. Everything was in disorder; the people had been long enslaved, and knew not how to use their freedom; and the president had been so much imbued with the centralizing principles prevalent at the courts which he had frequented, that some of his measures, especially that restricting the liberty of the press, gave offense to the most temperate of the enlightened lovers of civil liberty. His career was cut short by his assassination in a church at Nauplia on Oct. 9, 1831. The assassins were relatives of Peter Mauromichali, against whom he was urging on a prosecution, for alleged offenses against the state.

CAP OF MAIN'TENANCE, or DIGNITY, is a cap worn by noble and royal personages on certain state occasions. Such a cap was sent by pope Julius II. to king Henry VIII., for writing his book against Martin Luther.

CAPONIERE', or CAPONNIERE, in fortification, is a parapet 8 or 10 ft. high, with a superior slope, terminating in a small glacis. It is placed in the ditch of a fortified place, to cover or screen the defenders while passing from one defense-work to another. Generally, it has a banquette, on which musketeers may stand to fire over the crest. If there is a passage between two such parapets, it is a *full* caponnière; if on one side only, a *half* caponnière. Generally, the parapets are of earth, and the passage open overhead; but sometimes caponnières are vaulted galleries of brickwork, loopholed at the sides for musketry; while in field-works, palisade caponnières are occasionally thrown across the ditches of redoubts.

CAPPADO'CIA, anciently, a province, and subsequently a kingdom in the w. of Asia (in part the present Caramania). It was bounded by Lycaonia on the w., by Cilicia and Syria on the s., by Armenia on the e., and by Pontus on the north. During the time that it belonged to the Persian empire, however, it included Pontus, which was called Lesser Cappadocia. In 17 A.D., C. was erected into a separate province of the Roman empire, by Tiberius.

CAP'PAGH BROWN, a bituminous earth, which yields pigments of various shades of brown, the two most strongly marked being known as light and dark Cappagh brown. The coloring matter are oxide of manganese and iron. The Cappagh browns are transparent and permanent; and when not applied too thickly, they dry well in oil. The name is derived from Cappagh, near Cork, in Ireland. C. B. is also called encrome mineral, and more frequently manganese brown.

CAPPARID'EÆ, or CAPPARIDA'CEÆ, a natural order of exogenous plants, allied to *cruciferæ*, and including about 350 known species, herbaceous plants, shrubs, and trees, mostly natives of tropical and sub-tropical countries. The leaves are generally alternate, stalked, undivided, or palmate; the flowers solitary or clustered; the calyx of four sepals, sometimes cohering in a tube; the corolla of four, or sometimes eight petals, sometimes wanting, the stamens generally a multiple of four, or indefinitely numerous, placed on a hemispherical or elongated disk; the ovary one-celled, the style thread-like or wanting; the ovules curved; the fruit either dry and pod-like (tribe *cleomeæ*), or a berry (tribe *capparea*).—To this order belongs the well-known caper-bush. See CAPERS. Many of the species possess stimulant properties; some are poisonous. One of the most interesting plants of the order is the siwák (*capparis sodata*), a bush or small tree, one of the most characteristic features of the vegetation of Africa, from the Great Desert to the Niger, the small berries of which have a pungent taste like pepper, and, when dried, constitute an important ingredient in the food of the inhabitants of those regions; whilst the roots when burned yield no small quantity of salt.—*Barth's Travels.*

CAPPE, NEWCOME, 1732–1800; an English dissenting clergyman who studied under Doddridge, and adhered to Dr. Priestley's Unitarian doctrine. He was pastor of a dissenting congregation in York for more than 40 years, and was one of the ablest and most eloquent of his denomination. He was also the author of a number of devotional works.

CAPPEL, a village of Switzerland, in the canton of Zurich, and 10 m. s.s.w. of the city of that name. It is interesting as the place where the great reformer Zwinglius was killed in a conflict with troops of the Roman Catholic cantons, Oct., 1531. A monument has been erected here to his memory.

CAPPEL, a French family of scholars, theologians, and lawyers. GUILLAUME, in 1491, had the boldness to refuse the payment of tithes demanded by the pope. JACQUES, his son, was councilor of state under Francis I., and in 1537 made a powerful speech against Charles V. LOUIS, son of Jacques, was professor of theology at Sedan, and more than once risked his life in the cause of Protestantism. One of his acts was to present to Charles IX. the confession of faith drawn up by the Protestants of Paris. Two others, a son and grandson of Jacques, were distinguished, one in the law, and the other in theology, history, philogy, and antiquities, Both these were named JACQUES; and the younger was the father of LOUIS, the most celebrated member of the family (1585–1658), who studied at Sedan, Oxford, and Saumur, and was professor of Hebrew at the latter place. He devoted much attention to the text of the Scriptures. On the revocation of the edict of Nantes, Louis fled to England, where he died. His life was published by his nephew JAMES, who at only 19 years of age was professor of Hebrew at Saumur.

CAPRA'RA, GIOVANNI BATTISTA, 1733–1810; an Italian statesman and bishop, who served as papal legate or nuncio at Cologne, Lucerne, Vienna, and to the French republic in 1801, where he arranged the concordat of that year re-establishing the Roman Catholic form of worship. In May, 1805, he crowned Napoleon as king of Italy.

CAPRE'RA, or CABRERA, one of a group of small islands called the Buccinari islands, in the strait of Bonifacio, to the e. of the n. point of Sardinia (q.v.). They belong to the Italian province of Sassari. C. is separated from the coast of Sardinia by a strait of

little more than a mile in breadth, and by a similar narrow strait from the island of Maddalena, which lies to the west. Its greatest length, from n. to s., is about 6 m., and its breadth is from 2 to 3 miles. Like Maddalena and the rest of the Buccinari isles, and the neighboring coast of Sardinia, C. is rocky, bare, and unfertile. It has no streams, and is in few places adapted either for the pasture of cattle or for the plow In former times, it was the abode only of wild goats—whence its name (Lat. and Ital. *capra*, a goat)—and rabbits, and was occasionally visited by goat-herds and fishermen. It has of late years acquired celebrity as the ordinary residence of Garibaldi, who acquired a property and built a house here in 1854. He dwelt here from 1854 to 1858, and again made it his abode in the autumn of 1860. It was to C. that he was sent in Sept., 1867, in honorable banishment by the Italian government, after having been taken prisoner at Asinalunga, in consequence of his design of entering the Roman territory to promote an insurrection and overthrow the papal government, and in C. he had his residence when not in Rome, till his death in 1882.

CA′PRI (the ancient *Capreæ*), a charming island in the Mediterranean, at the entrance of the bay of Naples, about 3 m. from cape Campanella, and 20 m. s. of the city of Naples. On its small area of about 11 m. in circumference, it displays a rich variety of beautiful scenery, ruins of antiquity, and points of historical interest, and contains a pop. of about 6,000 souls. The island is composed of two mountain masses, separated from each other by a depression like the seat of a saddle. That on the w., called monte Solaro, which is the highest and largest, has an elevation of about 1900 feet. The eastern part does not attain a height of more than 860 ft. above the sea. At the base of the eastern mountain is situated the town of C., built on a shelving rock, and guarded by walls, gates, and draw-bridges, with a cathedral, and a pop., including the district, of about 4,000. It commands a beautiful prospect, and communicates with the little town of Anacapri, on the western table-land, by a flight of 535 rude steps, cut in the face of the rock. There are only two safe landing-places on the island, and these are at C. and near it. C. was a celebrated place, in the times of Augustus and Tiberius. Ruins are still found of Roman baths and aqueducts, and of the 12 grand villas or palaces built in honor of the 12 chief deities by the emperor Tiberius, who passed the last 10 years of his life here in the practice of the grossest licentiousness and cruelty. The inhabitants now consist of fishermen, sailors, and a few traders, with vine-dressers and cultivators of olives in Anacapri. Wherever a tree can be planted, the hopeful and industrious people have prepared for it a soil by persevering toil in terrace-culture. Delicious quails, which in vast numbers alight on the island during their migrations to and from Africa, in spring and autumn, are taken in nets, and form an important item in the resources of Capri. To the w. of the town of C. is situated the *Grotta Azzurra* (blue grotto), a remarkable cavern, entered from the sea by a narrow opening not more than 3 ft. high. Inside, however, it is found to be of magnificent proportions, and of marvelous beauty, the gorgeous coloring being said to be produced by the reflection and refraction of the sun's rays through the water. Elliptical in form, it has a length of 165 ft., a breadth of 100 in the widest part, and a height of 40 in the loftiest, with 48 ft. of water beneath.

CAPRIC′CIO (Ital.), in art, is applied to a picture or other work which designedly violates the ordinary rules of composition. Foliated ornaments, with cupids or other figures appearing in them in situations not strictly natural, are capriccios.

CAPRICCIO, in music, is a species of free composition, without being subject to rule as to form or figure. Locatelli, at the beginning of the 18th c., composed capriccios for the violin. The most celebrated C. of modern times is Mendelssohn's B minor C. for pianoforte and orchestra.

CAPRICORNUS, the *Goat*, a southern constellation, and the tenth sign of the zodiac (q.v.); denoted by the sign ♑, representing the crooked horns of a goat. It is usually represented on the globe as having the forepart of a goat, but the hinder part of a fish. It is one of the least striking of the zodiacal constellations. It was, however, celebrated among the ancients, who regarded it as the harbinger of good-fortune, and as marking the southern tropic or winter solstice, wherefore they called it the "Southern Gate of the Sun." It contains no large stars, the two largest, which are situated in the horns, being only of the third magnitude. Neither of these rises above the horizon in our latitude. See Tropics.

CAP′RIDÆ, a family of ruminant quadrupeds, which, as defined by some naturalists, may be described as the *sheep and goat* family, including the Linnæan genera *ovis* (sheep, q.v.) and *capra* (goat, q.v.); but which is extended by others to include antelopes, their persistent horns being regarded as the great distinction between them and the *cervidæ* or deer family. In the more restricted sense, the name designates a very natural family, yet differing from the *bovidæ* or ox family more in general appearance than in other characters; whilst links of connection with the antelopes are not wanting, a very remarkable one being found in the prong-horn of America.

CAPRIFICATION, a method which has long been employed in the Levant for securing and hastening the maturation of figs, and which consists in suspending fruit-bearing branches of the wild fig above or beside those of the cultivated tree. The notion once

entertained, that this practice is analogous to that by which the fecundation of the female palm-tree is secured, is inconsistent with the now well-known fact, that the fig has both male and female flowers within its own receptacle; and it is therefore supposed that the effects of C. may result from the agency of a species of insect, of which the eggs have been deposited in the early wild figs, and which may promote fecundation by entering the receptacle of the cultivated fig, or perhaps by puncturing it may cause it to ripen sooner. In hope of a similar advantage, some French and English cultivators have inserted into figs straws dipped in olive-oil. But C. is scarcely practiced in the western parts of Europe, and has even been discontinued as unnecessary in some parts of the east where it once prevailed.

CAPRIFOLIA'CEÆ, a natural order of exogenous plants, consisting of shrubs and herbaceous plants, which have opposite leaves without stipules, and flowers disposed in corymbs, in heads, or in whorls. The calyx is 4 to 5 cleft; the corolla monopetalous, tubular, or wheel-shaped, sometimes irregular. The stamens are adherent to the corolla at its base, and alternate with its lobes. The ovary is free, 1 to 5 celled. The fruit is generally a berry, sometimes dry, but not splitting open when ripe. The order is very nearly related to *cinchonaceæ,* differing chiefly in the want of stipules. More than 200 species are known, chiefly natives of the temperate and colder parts of the northern hemisphere. To this order belong the honeysuckle, elder, viburnum, and snowberry. Emetic and cathartic properties are prevalent in it.

CAPRIMUL'GIDÆ, a family of birds, of the order *insessores,* and tribe *fissirostres,* nearly allied to the *hirundinidæ* or swallow tribe, but differing from them in the still greater width of gape, and in having long stiff bristles at the base of the bill. They are insectivorous birds. They have very long wings, short legs, and toes united at the base by a membrane. The European goatsucker may be said to be the type of the family, which includes also the whip-poor-will and night-hawk of America, with many other species widely distributed over the globe, and now arranged by naturalists in a number of genera.

CAPRO'IC, Capry'lic, and Capric Acids are represented by the formulæ $C_{12}H_{12}O_4$, $C_{16}H_{16}O_4$, and $C_{20}H_{20}O_4$, and are members of the acetic or fatty-acid series. They derive their names from *capra,* a goat, in consequence of their more or less resembling in smell the odor of that animal. They may all be obtained from butter by pressing out the portion which remains liquid at 60°, saponifying this oil, and distilling the soap which is thus formed with sulphuric acid. The liquid which passes over contains these three acids, together with butyric acid, which, by being converted into baryta salts, are separable from one another. All three of these acids are also obtained by the oxidation of oleic acid by nitric acid; and capric acid is also obtained by acting upon oil of rue with fuming nitric acid; hence it is frequently called *rutic acid.*

CAPSA'LI, a seaport t. of the Ionian islands, capital of Cerigo, or Cythera, is built upon a narrow ridge, terminating in a precipitous rock near the s. end of the island. It has an old castle and a good harbor. Pop. 5,000.

CAPS and HATS, names of political parties in Sweden in the early part of the 18th c., the former favoring and the latter opposing the alliance with Russia.

CAPSICINE, an alkaloid, is the active principle in capsicum or Cayenne pepper, and can be obtained from it. It is a thick liquid, of a reddish color, and possessing such acrid properties that half a grain diffused through a large room causes every one therein to sneeze violently.

CAPSICUM, a genus of plants of the natural order *solanaceæ,* having a wheel-shaped corolla, projecting and converging stamens, and a dry berry. The species are all of a shrubby, bushy appearance, and have more or less woody stems, although they are annual or biennial plants. The number of species is very uncertain, some botanists distinguishing many, whilst others regard them as mere varieties of a few. They are natives of the warm parts of America and of Asia, have simple leaves, and rather inconspicuous flowers, and some of them are in very general cultivation in tropical and sub-tropical countries for their fruit, which is extremely pungent and stimulant, and is employed in sauces, mixed pickles, etc., often under its Mexican name of *chillies;* and when dried and ground forms the spice called *Cayenne pepper.* As a condiment it improves the flavor of food, aids digestion, and prevents flatulence. In tropical countries, it counteracts the enervating influence of external heat. In medicine, it is used as a stimulant, rubefacient, and vesicant; is often administered in combination with cinchona; and is particularly valuable both internally administered and as a gargle; not only in relaxed conditions of the throat, but in some of those diseases in which the throat is most dangerously affected. As a medicine, C. is administered in *pills,* mixed with bread; in the form of *tincture,* obtained by digesting the bruised C. in alcohol, or of an *infusion,* procured by digestion in water, with varying proportions of salt and vinegar. A gargle of C. is prepared by infusing it in water, along with candy-sugar and vinegar, and thereafter adding a little infusion of roses. It has no narcotic properties. It owes its power chiefly to *capsicine* (q.v.). The fruits of the different species of C. differ in form, being round, oval, conical, heart-shaped, etc.; they vary from half an inch to 4 in. in length, and are sometimes of a bright red, sometimes of a yellow color. In all, the dry berry has an inflated appear-

ance, and contains numerous whitish flattened seeds, which are even more pungent than the leathery epidermis, or the spongy pulp. Cayenne pepper consists chiefly of the ground seeds. *C. annuum*, sometimes called common C., or Chilly pepper, is perhaps the most common species in cultivation; and in the sourthern parts of Britain, if raised on a hot-bed as a tender annual, it produces fruit in the open border. There are several varieties of it. *C. frutescens*, sometimes called goat pepper, and *C. baccatum*, sometimes called bird pepper, have great pungency, and the former is generally described as the true Cayenne pepper. *C. cerasiforme*, with a small cherry-like fruit, and therefore called cherry pepper, and *C. grossum*, with a large, oblong, or ovate fruit, known as bell pepper, are frequently cultivated.—The fruit is used either ripe or unripe, except for making Cayenne pepper, for which ripe fruit is employed. The fruit brought from South America is sometimes sold by druggists under the name *Guinea pepper*.

CAPSTAN, on shipboard, is a ponderous mass of timber, whose uses are to heave the anchor, hoist up masts and guns, take in and discharge cargo, etc. It has very firm supports on the deck underneath it. It comprises a *barrel*, round which a rope or a chain coils; *whelps*, or pieces of timber, which enlarge the diameter without greatly increasing the weight; the *drum-head*, a polygonal flat piece of timber at the top, pierced laterally with holes; the *step*, or lowest part, which rests upon and is bolted to the beams; the *saucer*, an iron socket let into the top of the step; the *pivot* or *spindle*, which, resting on the saucer, forms the axis around which the C. turns; the *pawls*, short bars of iron, to prevent the reaction of the C.; *bars*, which enter the holes, and are the levers for enabling the sailors to work the C.; *pins*, placed vertically through the drum-head, for temporarily retaining the bars in their places; and the *shifter*, a rope connecting the outer ends of the bars. Among many improvements made in the arrangement and action of capstans is Wardill's, for increasing the bite or holding of a chain-cable around the circumference. In large vessels they are generally worked by steam.

CAPSULE, in botany, a dry fruit, *syncarpous* (or formed of several carpels united together into one), and opening either by valves, as in the fox-glove, primrose, and rhododendron, or by pores near the summit, which some regard as a sort of valves, and of which beautiful examples may be seen in the poppy and snapdragon. Capsules are either one-celled or many-celled. The *pyxidium* is a variety of C., which opens as if cut around near the summit, presenting the appearance of a cup with a lid, of which a very beautiful example may be seen in the *anagallis*, or pimpernel; and another in the great woody fruit of the different species of *lecythis* and other *lecythidaceæ*.

CAPTAIN, Military, is perhaps the most general designation given to an officer of land forces; something equivalent to it being found in most European languages. As a word, it simply means a *head* or *leader*, and may be applied to a chief over any number of men. *Captain-general* is in some countries a very high command. In the time of queen Elizabeth, there was, among other high military officers, a capt.gen. of footmen. In the organization of the British army at the present day, there is one C. to every *company* of infantry, and every *troop* of cavalry. Formerly every battery of artillery had two captains—a first and a second, the latter being called capt.lieut. Now, the first in command has the title of maj., and the second that of capt. The first in command of a battery of artillery, even when styled C., was considered higher than a C. of infantry or cavalry, and was privileged to be mentioned by name in military dispatches like cols. and majs.

The duty of the C. is to see to the men of his company in everything that relates to discipline, exercises, billeting, pay, settlement of accounts, mess, kit, clothing, arms, ammunition, accouterments, stores, barracks, cooking, etc.; to receive orders concerning these matters from the maj., and to enforce these orders among the men. He is responsible to the maj., and is assisted in his duties by the lieut. and sub-lieut. The number of captains on the peace establishment of the British army, in its several branches, are about 239 cavalry, 1236 infantry, 248 artillery, 115 for engineers, and 28 for colonial corps—1866 in all, in full commission. The former value of a C.'s commission, and the circumstances of purchase connected with it, are noticed under Commissions, Army.

CAPTAIN, Military (*ante*). In the U. S. army a C. is responsible for the camp and garrison equipage and the arms and clothing of his company. The rank is between lieutenant and major.

CAPTAIN, Naval, is the general designation for the commander of a ship. It is not universal, for some vessels of war are commanded by officers lower in rank than C.; while the chief officer of a merchant-vessel is often called *master*. The commanders of all rated ships are capts. The capts. rise to the command of larger and larger ships, with increase of pay, according to length of service. The C. is responsible for everything on shipboard, in discipline, navigation, equipment—all, in short, that concerns the *personnel* or the *matériel* of the ship. If his ship belongs to a particular fleet or naval station, he is responsible to some admiral or commodore; if not, he is directly responsible to the admiralty. The C. of that particular ship in a fleet which carries the admiral is called *flag* C., and is for the moment higher in rank than others. A naval officer is always on half-pay, except when attached to a ship in actual commission; and thus in

times of peace there have been always more naval capts. on half than on full pay; but recent measures have been adopted to assuage this evil. The number of capts. in the naval service during peace are about 83 in commission on full-pay. About 142 are on half-pay, under the designation of the *active* list; these are eligible for re-employment; while on the *reserved* list and the *retired* list there are 426 more. They rank in dignity with lieut.cols. in the army, and with cols. after three years' service.

The word C. is used in other ways also in the navy. The *C. of the fleet* is a temporary officer in large fleets; he promulgates the admiral's orders, and receives all the reports and returns, filling, in short, a post equivalent to that of *chief of the staff* in an army. Among the seamen on board a ship, the chief of each gang is called C.; such as the *C.* of the after-guard, of the forecastle, of the hold, of the main-top, of each gun, etc.

CAPTAIN, NAVAL (*ante*), in the U. S. navy, ranks with a col. in the army, and next below a flag-officer in the navy. Before the war of the rebellion there was no definite legal rank in the navy higher than captain. A C. of marines ranks with a lieutenant in the navy and with C. in the army.

CAPTION, in the practice of the law of England, may be defined as that part of a legal instrument which shows the authority under which it is executed, or taken, as the word implies. It also states the time and place of the execution. The word C. is also improperly used in England to signify an arrest—a meaning which it strictly and technically bears in Scotland, where, until the passing of the 1 and 2 Vict. c. 114, called the personal diligence act, which authorizes more simple forms of legal process, it was the only recognized civil warrant for the apprehension of a debtor or obligee. This word is also used in Scotland to denote a summary warrant of imprisonment, granted on the application of the clerk of court, for the purpose of forcing back the pleadings and other papers in a lawsuit, which had been borrowed by the party against whom the C. has issued, and by whom they are unduly and illegally retained. See on the subject of this article INDICTMENT, COMMISSION, DILIGENCE, WARRANT, HORNING.

CAPTIVES. It is laid down by Blackstone, that, as in the goods of an enemy, so also in his person, a man may acquire a sort of qualified property in him as a captive, or prisoner of war—at least till the ransom of the captive is paid. In Scotland, all legal proceedings against a captive are stopped till his liberation, although, in some cases, execution against his estate may proceed.

CAPTURE may be simply defined as prize taken in time of war. The law on this subject is stated with precision in a paper addressed on behalf of the British government to the American ambassador at London in Sept., 1794: "When two powers are at war, they have a right to make prizes of the ships, goods, and effects of each other, upon the high seas. Whatever is the property of the enemy, may be acquired by capture at sea; but the property of a friend cannot be taken, provided he observes his neutrality. Hence the law of nations has established—that the goods of an enemy on board the ship of a friend may be taken—that the lawful goods of a friend on board the ship of an enemy ought to be restored—that contraband goods going to the enemy, though the property of a friend, may be taken as prize; because supplying the enemy with what enables him better to carry on the war, is a departure from neutrality." The procedure to be adopted for determining whether the C. be or be not lawful prize, is now regaulted by the 3 and 4 Vict. c. 65.

During the Russian war in 1854, there appeared in the *London Gazette*, under date the 28th Mar., of that year, a declaration stating, *inter alia*, that her majesty would waive the right of seizing enemy's property laden on board a neutral vessel, unless it be contraband of war, and that it was not her majesty's intention to issue letters of marque for the commissioning of privateers. The right of seizing enemy's property on board a neutral vessel, whether contraband of war or not, had always before been maintained by England. On the re-establishment of peace with Russia, a treaty was signed, and the following declarations adopted: 1. Privateering is and remains abolished; 2. A neutral flag covers an enemy's goods, with the exception of contraband of war; 3. Neutral goods, with the exception of contraband of war, are not liable to C. under an enemy's flag; 4. Blockades, in order to be binding, must be effectual—that is to say, maintained by force sufficient to prevent effectually access to the coast of the enemy.

As to the right to property captured from the enemy, and its distribution as prize or booty of war among the officers and men of the army and navy, see BOOTY and PRIZE.

CAPTURE (*ante*). See INTERNATIONAL LAW, *ante*.

CAPUA, a fortified city of Italy, in the province of Caserta, beautifully situated in a rich plain, on the left bank of the Volturno, about 18 m. n. of the city of Naples, with which it is connected by railway, It is a military station of the first class, its defenses having been greatly extended and improved by Vauban. As it is the only fortress which guards the approach to Naples from the n., it was regarded as one of the keys of the former kingdom of that name. The only objects of interest in the city are the cathedral, with some splendid granite columns from ancient *Casilinum*, upon whose site C. was built in the 9th c.; the church of the *Annunziata* with some bas-reliefs; and the arch of the *Piazza dei Giudici*, under which many ancient inscriptions still exist. Pop. '71, 12,174.

The ancient *Capua*, which enjoyed a reputation for wealth and population second only to Rome and Carthage, was situated about 2 m. s.e. of the present city, where its ruins are still to be seen, its site being occupied by the modern town of Santa Maria di Capua. C. was founded by the Etruscans, under the name of *Volturnum*, as early, according to some authorities, as 800 B.C., and was the chief city of the twelve said to have been founded by them in this part of Italy. Its present name was derived from the Samnites, who captured it in 423 B.C. After the battle of Cannæ, 216 B.C., the popular party opened the gates to Hannibal, whose army was greatly enervated by its luxurious winter-quarters here. The Romans obtained possession of the city in 211 B.C. In the 5th C., A.D., C. was devastated by the Vandals under Genseric. It recovered its prosperity again to some extent, but it was totally destroyed by the Saracens in 840. The citizens, who had fled to the mountains, were induced by their bishop to return some 16 years later, and found the modern Capua. From the existing remains of the walls and fortifications of ancient C., it has been estimated that it had a circumference of 5 or 6 miles. It had seven gates. Among the Roman antiquities, one of the most remarkable is the amphitheater, built of bricks, and faced with white marble. Well-preserved arches, corridors, and seats for spectators, still remain. It is calculated to have been capable of holding 60,000 persons, and must have been altogether one of the most magnificent buildings of the kind in Italy.

CAP'UCHIN MONKEY, or CAPUCHIN SAPAJOU, a name often given to *cebus capuchinus*, and some other species of the genus *cebus*, South American monkeys, which have the head covered with short hair, so disposed as to resemble the cowl of a capuchin, the face being almost naked, or only covered with a little down. See CEBUS. *Pithecia chiropotes*, a South American monkey of a genus allied to *cebus*, is also sometimes called the C. M., or capuchin of the Orinoco.

CAP'UCHINS, a branch of the order of *Franciscans* (q.v.), so designated from the *capuche* which is their head-dress.

CAPU'CHINS, *ante*, a branch of the Franciscan order whose rule is essentially the same as that of the friars minor, or Minorites. They were founded by Matthew da Bassi, a Franciscan of Ancora, and were authorized by a bull of Clement VII. in 1528. At first they were persecuted by the other orders, but through the influence of the duchess Cibo, wife of the duke of Camerino, they obtained papal favor, and were permitted to impart their peculiar hooded habit to any who might be willing to join them, to live as hermits in wild and desolate places, to go barefoot, to wear beards, and to call themselves "Hermits Friars Minor." The pope, however, soon gave them the nickname "Cappucino," referring to the hood, one of their more conspicuous articles of apparel. They grew rapidly, and Matthew became the superior of the first convent. They have always had the reputation of great success in making converts. By late accounts they had 82 missions, in Europe, Asia, the East Indies, Africa, and South America. In the United States they have houses in the states of New Jersey, New York, and Wisconsin, Nuns of the order were first established at Naples in 1538.

CAPUDAN-PASHA', the high admiral of Turkey. He has the entire command of the navy and the management of all naval affairs. The port of Pera, the Turkish islands in the archipelago, and a number of seaports and maritime districts, are under him. even in their civil administration.

CAPULETS AND MONTAGUES, the English spelling of the names of the Cappelletti and Montecchi, two noble families of northern Italy, chiefly memorable from their connection with the legend on which Shakespeare has founded his play of *Romeo and Juliet*. According to tradition, both families belonged to Verona; but this does not appear to have been the case. The Cappelletti were of Cremona, and the fact that their burying-ground and the tomb of Juliet are shown at Verona, only proves how easy it is, in a country of ruins like Italy, to connect fact with fable. It has also been asserted that one family was Guelph and the other Ghibelline; but this is disproved by a reference to them in the *Purgatorio* of Dante (canto vi. l. 106). The poet is blaming the emperor Albert for neglecting Italy, the very garden of his domain. "Reckless man," he says, "come see how the Montecchi and the Cappelletti are oppressed;" and the context shows that the Guelphs were the oppressors in both cases of these great Ghibelline families. The emperor Albert was murdered in 1308, and this event has supplied the Veronese with a date for their legend. The first publication in which we recognize the essential incidents of Shakspeare's play is the novel *La Giulietta*, by Luigi da Porto, printed in 1535, after the death of the author. He states, in an epistle prefixed to the work, that the story was told him "by one Perigrino, a man fifty years of age, much experienced in the art of war, a pleasant companion, and, like almost all the Veronese, a great talker." In 1554, Bandello published in his collection of tales another Italian version of the legend. It was entitled *The unfortunate Death of two unhappy Lovers, one by Poison and the other of Grief*. Both writers fix the date of the event by saying it took place when Bartholomew dalla Scala or Scaliger ruled Verona. A French version of the tale was published by Pierre Borsteau in Belleforest's *Histoires Tragiques*. It was translated into English in 1567, and published in Painter's *Palace of Pleasure*. About the same time, Arthur Brooke published an English poem on the same subject, entitled *The Tragical*

History of Romeus and Juliet, written first in Italian by Bandell, and now in English. There is evidence that an English play had appeared previously, and that before Shakespeare's time the story was so well known in England that it had supplied subjects for tapestries. Shakespeare's play seems to have been principally based on the English poem. It was Brooke who first called the Montecchi Montagues, and the prince of Verona Escalus, instead of Scala. Wright and Cary, in translating Dante, have followed the example of Shakespeare, and render the Italian names of the *Divina Commedia* into the familiar "Capulets and Montagues" of *Romeo and Juliet.* The historical date of the tragedy has not, however, been adopted by modern stage managers and Shakespearian critics, who very properly bring down the action from the beginning to the close of the 14th c., when commercial opulence, and the revival of arts and letters, supply accessories more in keeping with the drama than the ruder age to which history must assign the "civil broils" and the fall of the Capulets and the Montagues.—See notes to Dante in *Classici Italiani,* and Knight's and Dyce's *Shakespeare.*

CAP'UT MOR'TUÜM VITRI'OLI, or COLCOTHAR, is the name given by the alchemists to the red powder (mainly red oxide of iron) which remains in the retorts when green vitriol or the sulphate of iron is calcined.

CAPY'BARA, *Hydrochœrus capybara,* a quadruped of the order *glires* or *rodentia,* and of the family *cavidæ,* strongly resembling the cavy or Guinea-pig, although it is the largest existing rodent known, and aquatic in its habits. It is a native of South America, and abounds in many of the large tropical rivers. It is equal in size to a small pig. The dentition resembles that of the cavy, except that the grinding teeth are composed of numerous transverse plates, the number of the plates increasing as the animal advances in age; an interesting point of resemblance to the dentition of the elephant, and a link of connection between the rodents and the pachydermata. The C. feeds exclusively on vegetable food, browsing on the grass near the rivers, and often committing great ravages in plantations of sugar-cane. It runs badly, but swims and dives well, and has the power of remaining under water for seven or eight minutes. It is very inoffensive, and easily tamed. The flesh, except that of old males, is good, and is eaten by all classes of persons. The C. is sometimes called water-hog, of which *hydrochœrus* is a Greek translation. In Demerara, it is called water-horse, a corruption of the Dutch *water haas* —i.e. water-hare.

CARAB'IDÆ, a tribe of beetles, or coleopterous insects, of the section *pentamera* (see COLEOPTERA), corresponding with the genus *carabus* of Linnæus, but of which the species are extremely numerous, those already known being numbered by thousands. They mostly feed on other insects, worms, etc., and are extremely voracious and active, habits which are fully shared by their larvæ. Some of them burrow in the earth; most of them live under stones, under the bark of trees, among moss, etc.; and their bodies are adapted to this mode of life, being very firm and hard. Their legs are in general pretty long, and most of them pursue their prey rather by the use of their legs than of their wings, some of them indeed being wingless, or having only rudimentary wings. Many of them exhibit much beauty of colors and metallic lustre. The largest British species is only about an inch long, but some foreign ones are much larger. Some of the species of the restricted genus *carabus* are among the most common British insects. Their wings are not fitted for flight.—A very large and singular insect of the tribe C. is *mormolyce phyllodes,* a native of Java, which, in consequence of the extremely depressed form of its body, resembles some of the *mantidæ* (q.v.), and the insects known as leaf-insects (q.v.). To this tribe belong also the bombardier beetles (q.v.).

CARBIDES, formerly termed CARBURETS, are compounds of carbon with metal None of them occur in a natural state.

CARABO'BO, a state in Venezuela on the Caribbean sea; a fertile well-watered region, producing grains, fruits, and cattle. The chief exports are coffee, cacao, indigo, rice, corn, rum, and fruits. The climate is good in the inland region, but the coast is subject to fevers. Capital, Valencia.

CARABOU. See REINDEER.

CARACAL, *Felis caracal,* a species of lynx (q.v.), found in the warmer parts of Asia, and throughout the whole of Africa; and more probably than any European species, the lynx of the ancients. It is larger than a fox, about the same height, but much more powerful; of a uniform deep brown or wine-red color, except two spots near each eye, the under parts of the body, and inner parts of the legs, which are white, and tufts of long black hair which terminate the ears. The C. is powerful enough to tear a hound to pieces. It is often represented as of a very savage disposition; but it is capable of being tamed, and has been employed in hunting.

CARACALLA, properly named MARCUS AURELIUS ANTONINUS BASSIANUS, a Roman emperor, the son of the emperor Septimius Severus, was b. at Lyon, 188 A.D. He was playfully named by his father Caracalla, from his long hooded tunic, made in the fashion of the Gauls, and so called in their language. After his father's death, 211 A.D., he ascended the throne as co-regent with his brother Publius Septimius Antoninus Geta, whom he afterwards caused to be murdered. Having bribed (at enormous cost) the Prætorians to overlook this foul deed, and to make him sole emperor, C. next directed his

cruelty against all the friends and adherents of Geta, of whom twenty thousand of both sexes—including the great jurist Papinianus—were put to death. Innumerable acts of oppression and robbery were employed to raise supplies for the unbounded extravagance of the despot, and to pay his soldiers. In his famous constitution, he bestowed Roman citizenship on all his free subjects not citizens—who formed the majority, especially in the provinces—but simply in order to levy a greater amount of taxes on releases and heritages, which were paid only by citizens. In his campaigns, he imitated, at one time, Alexander, at another time, Sulla; while his main object was to oppress and exhaust the provinces which had been in a great measure spared by the tyranny of former emperors. In 217, he was assassinated, at the instigation of Macrinus, prefect of the Prætorians, by one of his veterans named Martialis, on the 8th of April, 217, on the way from Edessa to Carrhæ. Historians paint the life of C. in the darkest colors. Among the buildings of C. in Rome, the baths—Thermæ Caracallæ—near Porta Capena were most celebrated, and their ruins are still magnificent.

CARACARA, or Caracara Eagle (*polyborus*), a genus of birds of prey peculiar to America, and regarded as a connecting-link between eagles and vultures; agreeing with the former in their strongly hooked bill and claws, but with the latter in their naked face and propensity to prey on carrion. The name C. is originally Brazilian, and is derived from the peculiar hoarse cry of a common Brazilian species (*P. Braziliensis*), a bird of very fine plumage, and about 50 in. in expanse of wings, which is of frequent occurrence over a large extent of the American continent, and is sometimes to be seen even in the southern parts of the United States.

CARAC'AS, the province of which the following city is the capital, extends in n. lat. from 7° 38′ to 10° 46′, and in w. long. from 65° 30′ to 68°, and contains 300,000 inhabitants. With a generally mountainous interior, the immediate coast is flat, presenting, besides La Guayra mentioned below, several harbors or roadsteads. The exports of the province are cocoa, coffee, dye-woods, hides, indigo, and sarsaparilla.

CARAC'AS, the capital of the republic of Venezuela, the most northerly state in South America, with Guiana on the e., and Columbia on the w., is situated in lat. 10° 30′ n., and long. 67° 5′ w., 16 m. s. of La Guayra, its port, with which it is joined by railway. It is 2,880 ft. above the tide-level, enjoying from this elevation a healthy air and a temperature so moderate as to average 68° and 72° F. in Feb. and June respectively. Standing immediately above the confluence of four streams, it is well supplied with cool water, which is distributed by means of fountains, pipes, and reservoirs. The neighborhood is subject to earthquakes—12,000 citizens having, in 1812, perished from this cause. The pop. in 1881 amounted to 58,000. The streets are straight and regular. The most splendid edifice is the church of Alta Gracia for the people of color, excelling the cathedral in the richness of its decorations. C. has a university founded in 1778.

CARAC'CI, a celebrated family of Italian painters, the founders of the Bolognese school of painting.

Caracci, Ludovico, the son of a butcher, was born at Bologna, 1555. As a student, he was so inapt that his master recommended him to abandon the pursuit; but instead of that, he went to Venice and Parma, making acquaintance with the works of the great masters there, and returned to Bologna imbued with art principles quite opposed to the superficial mannerism then prevailing in his native city. In conjunction with two of his cousins, who, instructed by him, had imbibed the same ideas, he founded, in spite of great opposition, the school which afterwards became so famous in the history of painting. The first principle of this new school was, that "observation of nature ought to be combined with imitation of the best masters." The allied artists found numerous pupils, to whom they gave practical instructions in drawing from natural and artistic models, with theoretical lessons on perspective, anatomy, etc. So great was their success, that, in the course of a short time, all other schools of painting were closed in Bologna. Some of the finest works of this master are preserved in the *Academia delle Belle Arte*, Bologna—among others, the "Madonna and Child Throned," "Madonna and Child Standing," the "Transfiguration," and the "Nativity of St. John the Baptist." Ludovico died in 1619.

Caracci, Agostino, cousin of Ludovico, was b. (1558) in Bologna. He became a disciple of his cousin, but he was of too versatile a genius to devote himself closely to any subject, though his magnificent painting of the "Communion of St. Jerome" proves that he might have attained to very great eminence had he devoted his undivided attention to the art; but he was in the habit of abandoning his easel for literature, poetry, and engraving on copper. As an engraver, indeed, he holds an important position in Italian art. He accompanied his younger brother, Annibale, to Rome, and there assisted in some of the paintings in the Farnese gallery; but his brother, who was a slave to his art, soon quarreled with him for his inattention, and he left Rome, and went to Parma. He died in 1602.

Caracci, Annibale, brother of Agostino, was b. (1560) in Bologna, where he learned, under his father, the business of a tailor, from which he was called away by Ludovico Caracci. His progress in the study of painting was rapid, and at first he took principally for his models Correggio, Titian, and Paul Veronese. His picture of "St. Roche distributing Alms" first gained for Annibale C. a wide reputation. His fame reached Rome, and he was employed to paint the Farnese gallery there, which is

considered his greatest work, and the manner of which partakes somewhat of Raphael and Correggio. On this gallery he was employed some eight years, and he received for his work the incredibly paltry sum of 500 crowns. In disgust and vexation, the artist threw aside his palette. He died in Rome in 1609, where his remains were interred, close to Raphael's tomb, in the Pantheon. Annibale C. was one of the greatest followers of Correggio, and in composition approached most nearly to the style of Raphael. Ludovico had a greater talent in teaching, and Agostino had a more versatile invention, but Annibale was unquestionably the greatest artist of the three Caracci.

CARACCI, ANTONIO, natural son of Agostino, was b. at Venice 1583; d. in 1618. He was a pupil under Annibale, and painted some excellent pictures.

CARACCI, FRANCESCO (styled FRANCESCHINI), brother of Agostino and Annibale, was b. in 1595, and distinguished himself as an eminent designer. He died 1622.—The best Italian masters of the 17th c.—Domenichino, Guido Reni, Albani, and others—proceeded from the school of the Caracci.

CARACCI'OLI. The name of a Neapolitan family unfortunately associated with the memory of lord Nelson. Several members of this family were employed in political offices.—LOUIS ANTOINE DE C., b. in Paris, 1721, d. 1803, was the author of a pseudograph, entitled *Lettres Intéressantes du Pape Clement XIV.*, which mystified many readers throughout Europe.—FRANCESCO C., a meritorious Neapolitan admiral, entered in early life the marine service, and distinguished himself at Toulon, 1793. In the year 1798, the offensive conduct of the court of Naples toward C. induced him to return from Palermo, where the court was then residing, to Naples, where he entered into the service of the republic established by the French invaders, and, with a few vessels, prevented the attempted landing of a Sicilian and British fleet. In 1799, when Ruffo took Naples, C. was arrested, contrary to the terms of capitulation, sentenced to death by the junta, hanged on the mast of a frigate, and his corpse thrown into the sea. This affair, to which lord Nelson was a consenting party, is a stain on the reputation of the English admiral.

CAR'ACOLE, in horsemanship, a sudden half turn, sometimes performed frequently in an attack of cavalry to mislead the enemy as to the point at which the assault is to be made.

CARACTACUS, a king of the Silures, who inhabited s. Wales, was one of the most persistent enemies of the Romans in Britain. For nine years he warred gallantly against the invaders, but at length was completely overthrown. His wife and daughters fell into the hands of the victors, and his brothers surrendered. C. himself fled to Cartimandua, queen of the Brigantes, who delivered him up to the Romans. He was carried to Rome, 51 A.D., and exhibited to the people by the emperor Claudius. When he approached the imperial seat, we are told, he addressed Claudius in so noble a manner, that he and his relatives were immediately pardoned. They appear, however, to have lived during the remainder of their lives in Italy.

CAR'ADOC SANDSTONE and BA'LA BEDS, a division of the lower Silurian system, so named from their development at Caer Caradoc, in Shropshire. They consist of sandstones, grits, and slates, with occasional beds of limestone. Enormous masses of contemporaneous igneous rocks are interstratified with them. They attain a thickness of 9,000 ft., not including the igneous rocks. Fossils are very abundant in some beds. They consist chiefly of trilobites (q.v.), brachiopoda (q.v.), and graptolites (q.v.).

The Silurian rocks in the southern districts of Ayrshire belong to this division.

CARA'FA DE COLOBRANO, MICHELE, 1785–1872; an Italian composer; in early life a soldier in the French army. Among his operas are *Masaniello* and *Le Solitaire.* He was a member of the Paris academy of fine arts, professor in the conservatoire, director of military music at the gymnase, and a member of the legion of honor.

CARAGLIO, a t. of northern Italy, in the province of Coni, 6 m. w. of the city of that name. It is situated on the Grana, and has manufactures of silk. Pop. '72, 3,379.

CA'RAITES. See JEWISH SECTS, *ante.*

CARAMA'NIA. See KARAMAN.

CARAM'BOLA, an East Indian fruit, of the size and shape of a duck's egg, but with five acute angles, or longitudinal ribs. It has a yellow, thin, smooth rind, and a clear watery pulp, in some varieties sweet, in others acid, of very agreeable flavor. It is often used in making sherbets, and in tarts and preserves; and is known to the British in India as the *Coromandel gooseberry.* It is one of the most universally cultivated and abundant of the fruits of India. It is produced by the *averrhoa carambola,* a small evergreen tree, or bush, of the natural order *oxalideæ.* The BILIMBI, or BLIMBING, is the very acid fruit of another species of the same genus, *A. bilimbi,* also East Indian. Both species are now much cultivated in the tropical parts of America. Both exhibit an irritability of leaf resembling that of the sensitive plant; they also display in a remarkable degree the phenomena known to physiologists as those of sleep of plants (q.v.).

CARAMEL is the name applied to the dark brown and nearly tasteless substance produced on the application of heat to sugar (q.v.). It is likewise formed during the roasting of all materials containing sugar, such as coffee, chiccory, and malt (see BEER), and is one cause of the dark color of porter and infusions of coffee. It is also employed in the coloring of whisky, wines, vinegar, etc.

CARAMNAS'SA, a river in the presidency of Bengal, which rises in lat. 24° 34′ n., and long. 83° 46′ e., and, after a course of about 150 m., enters the Ganges from the right in lat. 25° 28′ n., and long. 83° 58′ east. It is remarkable on several grounds. Though, on issuing from its source, it is clear as crystal, it is yet said to be both nauseous and noxious—a peculiarity which the natives impute to various supernatural causes; about 50 m. from its mouth, it is crossed by a stone bridge of three wide arches, which forms part of the grand road from Calcutta to Delhi; and lastly, it is so exceptionally subject to floods, that it has been known to rise 25 ft. in a night, when scarcely any rain had fallen in the adjacent plain of the Ganges itself.

CARA'NA RESIN, more commonly, but less correctly, called GUM CARANA, is a resinous substance imported from the tropical parts of America. Its properties and uses resemble those of tacamahac. It is entirely soluble in alcohol, and melts in a slight heat. It is not well known what tree produces it.

CARAN'JA, an island on the e. side of the ordinary entrance of the harbor of Bombay (q.v.), separated from the mainland by a narrow and unserviceable channel of 4 m. in length. It is itself 2 m. broad, being comparatively level and fertile, with the exception of two hills—the Little Hill in the n., and the Great in the south.

CARANX. See SCAD.

CARAPA, a genus of plants of the natural order *meliaceæ*, natives of warm climates. *C. Guianensis* or *guareoides*, sometimes called the anderaba, also the C. tree, is a large tree with beautiful shining pinnate leaves, which have many leaflets, a native of Guiana and the adjacent countries, where its bark has a great reputation as a febrifuge, and the oil obtained from its seeds is much used for lamps. Masts of ships are made of its trunk. The oil, which is called oil of carapa, is thick and bitter, and is anthelmintic.—*C. Touloucouna*, or *Guineensis*, an African species, yields a similar oil, which is employed by the negroes for making soap, and for anointing their bodies, its bitterness protecting them from the bites of insects, a purpose to which the oil of C. is also applied in South America.—These species are very similar, and are supposed by some botanists not to be essentially distinct.

CARAPACE, the dorsal shield or buckler of chelonian reptiles (tortoises and turtles), and of the *crustacea malacostraca* (crabs, lobsters, etc.). In animals so widely different, however, there is only,a general similarity in the appearance of the C., and the purpose which it serves; its organic relations are very different. For notice of these, we refer to the articles CHELONIA and CRUSTACEA.

CAR'AT, originally, it would seem, the name given to the seeds of the Abyssinian coral flower (q.v.) or coral-tree (*erythrina Abyssinica*); but these, which are small, and very equal in size, having been used in weighing gold and precious stones, C. has become the designation of the weight commonly used for weighing precious stones, and particularly diamonds. The seeds of the carob (q.v.) tree have also been said to be the original C. weights of jewelers, but with less probability.

Goldsmiths and assayers divide the troy pound, ounce, or any other weight, into 24 parts, and call each a C., as a means of stating the proportion of pure gold contained in any alloy of gold with other metals. Thus, the gold of our coinage and of wedding-rings, which contains $\frac{22}{24}$ of pure gold, is called "22 carats fine," or 22 C. gold. The lower standard used for watch-cases, etc., which contains $\frac{18}{24}$ of pure gold, is called 18 C., and so on. The C. used in this sense has therefore no absolute weight; it merely denotes a ratio. This, however, is not the case with the C. used for weighing diamonds, which has a fixed weight, equal to $3\frac{1}{6}$ troy grains, and is divided into quarters, or "C. grains," eighths, sixteenths, thirty-seconds, and sixty-fourths. These C. grains are thus less than troy grains, and therefore the jeweler has to keep a separate set of diamond weights.

CARAU'SIUS, a supposed native of Holland, of whom nothing is certainly known except that he had a conspicuous part as an ally of the Romans in the conquest and ruling of Britain near the close of the 3d century. He had been put in command of the fleet in the English channel for the purpose of protecting the coasts of Britain and Gaul from the Frisian pirates; and his conduct had been such that the Roman emperor Maximilian gave an order for his death. C. immediately assumed the title of emperor of Britain, and held power for about seven years, his independence having been acknowledged by the Romans, whose empire was rapidly falling into ruin. He was assassinated at York in 293 by his chief officer and rival, Allectus, who held the imperial title for three years, at end of which time (296) Constantine Chlorus re-established the rule of Rome.

CARAVA'CA, a t. in Spain, in the province of Murcia, about 39 m. n.w. of the city of that name, is situated on the slope of a hill crowned with a fine old castle. Its principal

streets are wide, clean, and well paved; it has a fine church, with a miraculous cross, that is annually taken down and bathed in the waters of the town, to which it is supposed to communicate sanitary properties. It has manufactures of linen and woolen fabrics, soap, paper, leather, etc. Pop. about 10,000.

CARAVAG'GIO, a t. of northern Italy, in the province of Bergamo, about 24 m. e. of Milan. In the principal church are some esteemed paintings by Campi; and C. is also celebrated as the birthplace of the painters Polidoro Caldara, and Michael Angelo Merighi, both surnamed Caravaggio. In the neighborhood is a sanctuary of the Madonna, built from designs of Pellegrini (1575). Pop. about 7,000.

CARAVAG'GIO, Michael Angelo Amerighi or Merighi da, a celebrated Italian painter, was b. 1569, at Caravaggio, in Lombardy, northern Italy. His father, who was a mason, employed him in making paste for the fresco-painters, and in this way the artistic genius of the boy was stirred. After studying the works of the great masters in Milan and Venice, he went to Rome, where he lived for some time in very reduced circumstances. At length a picture of his attracted the notice of cardinal del Monte, who now patronized the young artist; but the ferocious and quarrelsome character of C. soon involved him in difficulties. Having fled from Rome to Malta, on account of manslaughter, he obtained the favor of the grand-master by painting an altar-piece in the church of St. John, and other pictures. His quarrelsome nature soon forced him to flee from Malta; and, in making his way back to Rome, he was wounded, lost all his baggage, caught a violent fever, and on reaching Porto Ecole, lay down on a bank and died (1609), at the age of 40. Trueness to nature was the object aimed at by C., who left all schools, and devoted himself to paint life as he found it in lanes, alleys, and other resorts of the lower classes. He studied no such matters as refined sentiment or elevation of realities, but gave in his paintings expression to his own wild and gloomy character. One of his best paintings, "The Fraudulent Gamblers," is preserved in the Sciarra gallery, at Rome. His shadows are deep, his backgrounds very obscure; in consequence of which the whole picture seems to possess a kind of mysterious greatness, that is very imposing. Even Rubens confessed that C. was his superior in chiaro-oscuro. When he painted sacred subjects, he remained falsely faithful to the low realities of Italian life; so that several of his pictures painted for churches, had to be removed from their places, because they could not be harmonized with sacred associations. Kugler, the German critic, has justly said of one of C.'s most celebrated works, a "Burial of Christ," that it appears "like nothing better than the funeral of a gypsy chieftain."—An earlier Italian painter of less eminence, Polidoro Caldara da Caravaggio, was born in 1495, and murdered in 1543.

CARAVAN (from the Persian *karvan*, i.e., trader), the name given to the great assemblages of travelers which, at stated times, traverse the deserts of Asia and Africa. Many caravans are entirely for the purposes of trade, the merchants associating themselves for mutual help and protection. A C. sometimes has so many as 1000 camels, which follow each other in single file, so that it may be a mile or more in length. The most celebrated caravans are those formed by pilgrims going to Mecca, particularly those which annually assemble at Cairo and at Damascus. The latter consist of 30,000 to 50,000 pilgrims, and is under the special protection of the Turkish sultan. The caravan by which the Persians travel to Mecca starts from Bagdad, and is the vehicle of a very important trade. The great Indian C. to Mecca, which started from Muscat, has been long given up. Mecca, upon the arrival of the caravans, bringing goods from so many different parts of the world, presents all the appearance of a vast fair. The trade between Tripoli and the interior of Africa is exclusively carried on by caravans, likewise that between Darfur and Egypt. The great trade between Russia and China is also a C. trade. In the east, caravans in which the camels have a load of 500 to 600 lbs. are called *heavy* caravans; *light* caravans are those in which the camels have only half that weight, so that the daily journeys may be longer. *Heavy* caravans travel from 17 to 18 m. a day; *light*, from 22 to 25. The caravans are generally conducted with great regularity, and assemble at and start from stated places on stated days. The leader of the Mecca caravans is called emir-el-hadsch, i.e., prince of the pilgrims. In trade-caravans, a leader, who is called karwan-baschi, is elected by the merchants from their own number.

Among the knights of Malta, caravans meant the troops of knights appointed by the order to serve in garrisons, and also the cruises of their galleys against the Turks.

CARAVANCES. See Chick Pea.

CARAVANSARAI, or Khan, an eastern institution, a sort of unfurnished inn to provide travelers with a shelter. Those in towns and cities, which are generally built for traders, and charged a small sum a day, are handsomer and more convenient—having doors to the apartments—than those met with on the roads or outside the walls of the cities. They commonly consist of a square building of four wings built round a courtyard, in which the beasts of burden may be inclosed, and where there is usually a well of water; the lodgings are small rooms, about 7 or 8 ft. high, which run round the courtyard, and are bare of every article of furniture.

These caravansarais are an institution of very ancient date, being the "inns" of Gen.

xlii. 27, xliii, 21; and it was in the stable of such a place, there being no room for his parents in the lodging apartments, that our Savior was born (Luke ii. 7). They belong either to government, to some private individual, or are the property of the church (mosques); those situated in towns or cities are charged, but not more than two or three Turkish piastres a day; those situated on the road are usually free. There are some large and very handsome caravansarais at Cairo, Damascus, Beyrout, Aleppo, etc. The steward or keeper of a C. is called a *caravanseraskier*.

CARAVEL'LAS, a seaport of Brazil, in the province of Espiritu Santo, near a bay of that name; pop. about 5,000. It is the principal port of the surrounding country, and the head-quarters of the whale fishery of the Abrothos islands, which lie off the coast.

CARAWAY, *Carum carui*, a plant of the natural order *umbelliferæ*, growing abundantly in meadows and rich pastures in the middle and s. of Europe, and in some parts of Asia, naturalized in many places in Britain. In some parts of Holland and Germany, and also in the counties of Kent and Essex in England, it is extensively cultivated for its aromatic seeds—in more strict botanical language, *carpels*—which are used medicinally as a carminative and tonic, and are also very much used as an aromatic condiment, and by confectioners, distillers, and perfumers, entering into the preparation of liqueurs, cakes, sweetmeats, scented soaps, etc. They depend for their aromatic properties on a volatile oil called oil of C., which is obtained by bruising C. seeds, and distilling them with water, and is at first limpid and colorless, but becomes yellow and subsequently brown by keeping. Oil of C. is used medicinally to relieve flatulence, and to correct the nauseating and griping tendencies of some cathartic medicines; also in the preparation of *spirit of C.* and *C. water*.—Spirit of C., which may be prepared either by dissolving the oil of C. in proof-spirit, or by distilling bruised C. seeds along with proof-spirit, is much used in Russia and Germany as a liqueur (*kümmel-branntwein*), sweetened with sugar.—C. has a branching stem 1 to 2 ft. high, with finely divided leaves, and dense umbels of whitish flowers. The fruit is oblong, each carpel having five thread-like ribs, with a single *villa* (see UMBELLIFERÆ) in each of the interstices. The white carrot-shaped root of C. is sometimes used like carrots or parsnips, but has a very strong flavor.—C. has a great enemy in the CARAWAY MOTH (*hæmylis daucella*), the larva of which destroys both its stem and flowers.

CARBAZO'TIC ACID, or PICRIC ACID, is a substance of great importance in dyeing, which is obtained by the action of strong nitric acid and heat on many complex organic materials, such as silk, indigo, salicine, and a variety of resins. On a commercial scale, it is best obtained from the oil of tar, which distills over from crude tar between 300° and 400°, or from the resin of *xanthorrhœa hastilis*. The hot nitric acid solution is strained from impurities, and on cooling, yellow crystals separate of C. A., which can be purified by washing with cold water. These crystals are readily soluble in alcohol and ether, and dissolve in 80 or 90 times their weight of cold water, yielding a yellow solution, which has a very bitter taste, and stains the skin yellow; and when silk which has been treated with a mordant of alum, or cream of tartar, is immersed in a solution of C. A., it is dyed of a beautiful permanent yellow color. The bitter taste of C. A. has led to its being fraudulently employed, instead of hops, in communicating a bitter taste to beer.

CARBIDES. See page 889.

CARBINE is a light kind of musket, named probably from the Carabins. See next article. It is now used by the cavalry, the yeomanry cavalry, the Irish constabulary, and other corps. The best carbines are now rifled. A considerable number of American carbines, rifled and breech-loading, were purchased at a high price by the English government in 1856. This American C. has a barrel only 22 in. in length, and a total weight of 7½ lbs. It is simple in construction, has a great range, hits a mark with accuracy, may be fired with rapidity, requires little cleaning, can be loaded without a ramrod, and supplies itself with caps from a reservoir in the hammer. Among English makers, Mr. Prince has successfully applied the breech-loading principle to carbines. The Victoria cavalry C. has a barrel 26 in. long, with 0.733 in. bore; its weight is 7½ lbs., and it is fired with 2½ drams of powder.

CARBINEERS, or CARABINEERS, are said to have derived their designation from the Arabs, among whom the *Carabins* or *Karabins* were light horsemen, stationed at outposts to harass the enemy, defend narrow passes, etc.; in action, they took the place of skirmishers. A corps under the same name was raised in France in 1560; but the designation has not been much used in that country since the introduction of hussars and lancers. In the English army, C. was at one time a frequent designation for cavalry; but now there is only one regiment, the 6th dragoon guards, known by this title; and the distinction between them and other cavalry is little more than nominal.

CARBOHY'DROGENS, or HYDROCAR'BONS, are a series of compounds belonging to organic chemistry, which are composed of carbon and hydrogen, in such proportions that the various members of the group differ from each other in definite and regular numbers of atoms of carbon and hydrogen. The best marked group of hydrocarbons commences with methylene (C_2H_2), which may be regarded as the first step in the ladder, and by the successive addition of other two atoms of carbon and hydrogen, we

obtain ethylene or olefiant gas (C_4H_4), propylene (C_6H_6), butylene or oil gas (C_8H_8), amylene ($C_{10}H_{10}$), etc. There are also series beginning with methyl (C_2H_3), then ethyl (C_4H_5), and with hydride of methyl or marsh gas (C_2H_4), then hydride of ethyl (C_4H_6). The members of these groups are likewise characterized by a gradual ascending difference in their chemical and physical properties, especially the boiling-point, which rises by a given amount.

CARBOLIC ACID, or PHE'NIC ACID (C_6H_6O), is the principal acid substance procured during the distillation of coal-tar. It is produced also by the distillation of gum benzoin and the resin of *xanthorrhœa hastilis,* and is present in the urine of the cow and some other animals. It crystallizes at ordinary temperatures in colorless needles. It smells like tar or creosote, and has a hot taste. It is a powerful antiseptic, and quickly arrests all putrefactive and fermentive changes. Hence it is used, freely diluted in water, as a dressing in the antiseptic system of treating wounds, first practiced by Mr. Lister, when professor of clinical surgery in Edinburgh university. It is also used for purifying or rendering inoffensive sewage (q.v.), etc.

CARBOLIC ACID. Since the article on this substance first appeared in the *Encyclopædia,* much has been ascertained regarding its uses, both as a therapeutic agent and as a disinfectant. It has been introduced into the new British pharmacopœia (1867), where its characters and tests are thus described: "In colorless acicular crystals, which at a temperature of 95° become an oily liquid, having a strong odor and taste resembling that of creosote, which it also resembles in many of its characters and properties. Its specific gravity is 1.065; boiling point, 370°. The crystals readily absorb moisture on exposure to the air, and they are thus liquefied; the acid, however, is but slightly soluble in water, but it is freely soluble in alcohol, ether, and glycerine. It does not redden like litmus paper; a slip of deal dipped into it, and afterwards into hydrochloric acid, and then allowed to dry in the air, acquires a greenish-blue color. It coagulates albumen. It does not affect the plane of polarization of a ray of polarized light." It may be taken internally in doses of from one to three grains in the same class of cases as those in which creosote is prescribed. Its principal uses are as external applications, in which, in various degrees of dilution, it is serviceable in unhealthy ulcerations, gangrenous sores, ozæna and all fetid discharges, gleet, the destruction of lice, and especially, as prof. Lister has shown, as an application in compound fractures (in which it coagulates all albuminous effusions, and forms a solid crust, impermeable to air, over the broken surface), and to abscesses immediately after they have been opened. Indeed, it is most probable that his investigations on the treatment of abscess will, like those on the treatment of compound fractures, lead to a total alteration in this department of surgery. The observations of Pasteur and others have shown that, in even apparently the purest air, numerous organic germs are always floating. In a hospital ward, these germs are multiplied to an extraordinary degree. In any wound exposed to the atmosphere (as a compound fracture), decomposition takes place by the action of these germs, and hence it is necessary to introduce the C. A., which has the power of destroying these germs, into the interior. In an unopened abscess, no septic organisms are present, and the object of the surgeon is to guard against their introduction from without, and at the same time to afford a free exit for the discharge of the contents of the abscess. The following are the outlines of prof. Lister's mode of proceeding: A square piece of rag is dipped in a solution of one part of crystallized C. A. and four parts of boiling linseed oil, and is laid upon the skin where the incision is to be made. The lower edge being raised, a scalpel dipped in the oil is plunged into the cavity of the abscess, and a sufficient opening made; and the moment the knife is drawn, the raised part of the rag is dropped upon the skin as an antiseptic curtain, beneath which the pus escapes. The cavity of the abscess is firmly pressed, so as to remove as nearly as possible all the existing pus, and if it should seem expedient, a piece of lint dipped in the oily mixture may be introduced, so as to check bleeding and prevent primary adhesion of the cut surfaces. "Thus," says prof. Lister, "the evacuation of the original contents is accomplished with perfect security against the introduction of living germs. This, however, would be of no avail unless an antiseptic dressing could be applied that would effectually prevent the decomposition of the stream of pus constantly flowing out beneath it." He finds that the most suitable dressing is made as follows: Six tea-spoonfuls of the oily solution are mixed with common whiting (carbonate of lime) so as to form a putty, which is spread upon six inches square of common tinfoil, strengthened with adhesive plaster to prevent its tearing. The tin thus spread with putty is laid upon the skin, so that the middle of it corresponds with the point of incision, the antiseptic rag used in opening the abscess being removed the moment previously. The tin is then fixed with adhesive plaster, the lowest edge being left free for the escape of the discharge into a folded towel placed over it, and secured with a bandage. The dressing must be removed every day, and a piece of rag dipped in the oily solution must be placed on the incision when the first tin is removed, so as to guard against the possibility of the entrance of germs during the cleansing of the skin with a dry cloth, and pressing out any discharge that may exist in the cavity. If a piece of lint was inserted into the wound, it must be removed when the tin is applied. From the absence of the irritation excited by decomposition, pus almost at once ceases to be formed under this treatment; and large

abscesses, after their original contents have been evacuated, often yield in 24 hours only a few drops of serum in the course of a few days. The pharmacopœia gives the glyceride of C. A. (consisting of one part of the acid to four of glycerine) as a good form for local application; but the proportion of acid must vary with the case.

The value of C. A. as a disinfectant was placed beyond all doubt by the investigations made at the request of the royal commissioners, who were appointed to obtain information and report on the cattle disease. In the same way, C. A. is highly serviceable in military camps, on board ship, in disinfecting dunghills, in purifying the air of sick-rooms, stables, bird-cages, and any place where the germs of disease do or may lurk. It is extensively used for preserving wood, as in railway sleepers. It has recently acquired importance as a source of dye-stuffs, Victoria orange, phénicienne or phenyl brown, coralline, etc. C. A. acts as a powerful poison on animal and vegetable life in general. The creosote (q.v.) obtained from coal-tar is often simply a form of carbolic acid.

CARBON is one of the elementary substances largely diffused in nature. It occurs uncombined in the mineral graphite, or black-lead (q.v.), and in the diamond (q.v.), which is pure crystallized carbon. It is much more abundant, however, in a state of combination. United with oxygen, it occurs as carbonic acid (CO_2) (q.v.) in the atmosphere, in natural water, in limestone, dolomite, and ironstone. In coal, it is found combined with hydrogen and oxygen; and in plants and animals, it occurs as one of the elements building up wood, starch, gum, sugar, oil, bone (gelatine), and flesh (fibrine). Indeed, there is no other element which is so characteristic of plant and animal organisms, and it ranks as the only element never absent in substances obtained from the two kingdoms of organic nature. Wood-charcoal, coke, lampblack, and animal charcoal are artificial varieties, more or less impure, of carbon. The atomic weight or equivalent of C. is 6 (new sys. 12); the specific gravity greatly varies; that of the diamond is 3.330 to 3.550 (water being 1.000), and of graphite 1.800. C., in its ordinary forms, is a good conductor of electricity; in the form of diamond, it is a non-conductor. Of heat, the lighter varieties of C., such as wood-charcoal, are very bad conductors; graphite in mass has very considerable conducting powers. At ordinary temperatures, all the varieties of C. are extremely unalterable; so much so, that it is customary to char the ends of piles of wood which are to be driven into the ground, so as by this coating of non-decaying C. to preserve the interior wood; and with a similar object, the interior of casks and other wooden vessels intended to hold water during sea-voyages, are charred (coated with C.), to keep the wood from passing into decay, and thereby to preserve the water *sweet*. Its power of arresting odors and colors likewise varies much. See BONE-BLACK. In the simple property, even of combustion, there is a marked difference. Wood-charcoal takes fire with the greatest readiness, bone-black less so; then follow in order of difficulty of combustion—coke, anthracite, lampblack, black-lead, and the diamond. Indeed, black-lead is so non-combustible, that crucibles to withstand very high heats for prolonged periods without breakage or burning, are made of black-lead; and the diamond (q.v.) completely resists all ordinary modes of setting fire to it. In the property of hardness, C. ranges from the velvet-like lampblack to diamond, the hardest of gems. In 1879, it was announced that a method of producing pure crystallized carbon, or diamond, had been discovered in Glasgow.

Carbon for electrical purposes.—When C. is obtained of sufficient density, it is found to be a good conductor of electricity, and to make an excellent electro-negative element in a galvanic pair. Graphite displays these qualities to advantage, and so does the hard incrustation of C. that is found sublimed in gas retorts. Coke and wood-charcoal are too porous to possess them to any great extent. The scarcity of graphite, and the precarious supply of retort C., preclude the possibility of obtaining much practical advantage from the electrical properties of C. with these substances alone. We are indebted, however, to prof. Bunsen, of Heidelberg, for the discovery of a process whereby a C. of the requisite density can be manufactured with great ease and economy. The carbons thus obtained for galvanic batteries rival platinum in electric energy, and they have aided in no small degree, from their cheapness, in heightening the utility of galvanic electricity. The Bunsen carbons, as manufactured in Germany, are of the form of hollow cylinders, whereas those made in France and this country are solid rectangular prisms. The following are the more important details of the process. Two parts of coke, and one of baking-coal—the proportion varying to some extent with the materials—are ground to a fine powder, and passed through a sieve. The powder so got is transferred to iron-plate molds of the required shape, the seams of which are merely clasped together, and luted with clay. No pressure is employed in filling them, other than that of shaking. When the molds are filled, they are placed in a furnace, and kept there till all carburetted hydrogen has escaped from them. They are then taken out, and allowed to cool before the mass within is removed, which is now found to have taken a solid form, and to be so hard that it may be turned or ground to the exact size wanted. At this stage, the carbons are destitute of electrical action, and they must consequently be rendered more dense by a subsequent process. This consists in soaking them thoroughly in thick sirup, or, better still, in gas-tar thickened by boiling, and laying them aside till dry, after which they are packed with charcoal-dust in fire-proof crucibles.

and exposed for a considerable time to a high heat. If one soaking and charring is not enough, the same may be repeated until sufficient density is obtained. Throughout the process, it is essential that all flaming matters be driven off, so as to leave only the C. in the mold; and care must be taken that no air be admitted to the mold when under the action of heat, otherwise there would be a loss of C. from combustion. The manufacture of these carbons may be carried on contemporaneously with that of gas. The sticks of C. used for the electric light are obtained by sawing up either C. made by this process or the C. of the gas retorts.

CARBON, a co. in e. Pennsylvania; 400 sq.m.; pop. '80, 31,922; a mining region, on the Lehigh river, and the Lehigh Valley and other coal-transporting railroads. Next to the mining of anthracite coal, the chief business is agricultural. Co. seat, Mauch Chunk.

CARBON, a co. in Wyoming territory, extending entirely across the territory, from Montana to Colorado; 15,000 sq.m.; pop. '80, 3438. The co. is crossed by the Union Pacific railroad. Co. seat, Rawling's Springs.

CARBONA'RI (literally "colliers" or "charcoal-burners"), the name of a secret political society, first, in some degree, made known in 1820. The constitution, like the precise objects of the C., still remains in a great measure secret; though they have printed instructions, catechisms, statutes, rituals, etc., for their associates. The statements respecting the high antiquity of this secret confederacy are quite fabulous. There is every reason to believe that it originated during the last French *régime* in Naples. Botta, in his *Storia d'Italia*, states that, under Murat's government, the Neapolitan republicans, equally hating the French and king Ferdinand, escaped into the wild defiles of the Abruzzi, and here, naming themselves "C.," formed a secret society. It is said that their leader, Capobianco, had great powers of popular eloquence, and that their motto or war-cry was, "Vengeance for the lamb torn by the wolf."

The peculiar phraseology of the C. is taken from the vocation of charcoal-burners. For instance, they are (or were) wont to speak of "clearing the forest of wolves." The "wolves" probably meant at first foreign tyrants; but in the course of time, after the restoration of the Neapolitan Bourbons, such symbolical expressions had reference to *their* despicable misrule. Among themselves the initiated were styled "good cousins." The various societies do not seem to have possessed a common center, or to have been properly organized for combined action. A place of meeting was styled "a hut" (*baracca*); the external neighborhood "the forest;" and the interior of the hut was the *vendita* or "place for selling coal." A union of several of these huts formed a "republic." The superior huts (*alte vendite*) at Naples and Salerno, endeavored, but without success, to effect a centralization of the Carbonari. The society, soon after its institution, numbered 24,000 to 30,000 adherents, and increased so rapidly in Italy, that in Mar., 1820, it is said as many as 650,000 new members were initiated, including considerable numbers of the military and the clergy. The religious and Protestant character of the order is expressed in its statutes, which include the article: "That every carbonaro has the natural and unalterable right of worshiping God according to his own convictions." Though carbonarism did not arise from the lodges of freemasons (as several have supposed), it has borrowed many forms of masonry.

After the restoration of the Bourbons several secret political unions were formed in France, and in 1820 were confederated with the Carbonari. Paris, after the prosecutions against the secret societies of Italy, was made the head-quarters of a carbonarism which, adopting all the symbolic phraseology, rules, and regulations of the Italian societies, received from the rapidly systematizing genius of the French, an organic character which it had never before possessed. The initiated styled themselves *bons cousins*, and spoke of the uninitiated as *pagani* (heathens). Written documents and communications were strictly prohibited by the heads of the union, and treachery was to be punished by assassination. After the close of the French and Spanish war, the C., whose activity in contriving plots had excited the terror of the French prefects, restricted its endeavors to the circulation of republican ideas, without direct attempts towards insurrection. After the July revolution, several of the leading French C. attached themselves to the new régime, and their society was gradually dissolved. In its place the new *Charbonnerie Démocratique* was founded, having for its object the establishment of a republican government, founded on the principles of Babeuf (q.v.). The endeavor of these new C. to make Paris the center of all political movements, led to the secession of the Italian refugees, who associated themselves under the title "Young Italy." French carbonarism is not *known* to exist at present, and it is possible that even in Italy the triumphs of constitutional patriotism during recent times have rendered its existence no longer necessary, but it certainly was alive at the commencement of the Franco-Sardinian war with Austria; and one of the rumors of the time was, that the French emperor—who, in his young republican days, had been a member of this society—had entered on the war of liberation, to conciliate his old associates, who had menaced him with the fate of a traitor.

CARBONATED or ACID'ULOUS WATERS are those which contain a great excess of carbonic acid gas. The amount of gas in ordinary spring and well waters does not amount to more than 3 to 8 cubic in. in 100 cubic in. of the water; but in waters enti-

tled to be called C., the proportion of gas to 100 cubic in. of water rises 30 to 60, when they are considered rich; 100 to 200 when they are very rich; and in the waters of St. Nectaire it is said that the proportion of gas is as high as 400 volumes to 100 of the water. These waters sparkle much when poured from one vessel to another. The carbonic acid is free, but is generally accompanied (1) by bicarbonate of soda, when the water is called *carbonated-alkaline* or *acidulo-alkaline*, as in the Seltzer, Pyrmont, Salzbrunn, Altwasser, and Reinerz acidulous mineral springs; or (2) by carbonate of iron, when the water is named *carbonated* or *acidulous chalybeate*. See CHALYBEATE WATERS. The mineral spring at Irkeston, near Nottingham, is the only water of this nature in Britain. The C. or acidulous waters are very refreshing and exhilarating, and are useful in certain disordered states of the stomach; they relieve nausea, and generally increase the discharge of liquid from the system. They are objectionable in the case of persons of a full and inflammatory state of body.

CARBONATES, chemical substances which are compounds of carbonic acid with a base; e.g., carbonates of lime, potash, soda, iron, lead, copper, silver, etc. Their formulæ are: carbonate of lime (marble), CaO,Co_2; carbonate of potash, KO,CO_2; carbonate of iron (protoxide), FeO,CO_2, etc. As affinities of carbonic acid are very weak, carbonates are easily decomposed: by heat, as in reducing marble and limestone to lime; by a more powerful acid, as in the preparation of certain kinds of bread, which are made light by the carbonic acid set free from the bicarbonate of soda, the carbonate of potassa, or the carbonate of ammonia, by the acid of sour milk; by the acid tartrate of potash (cream of tartar); by an acid phosphate, prof. Horsford's method; or by hydrochloric acid; or as in the preparation of so-called soda-water, which is merely common water surcharged with carbonic acid set free from marble chips by sulphuric acid.

CARBONDALE, city, Lackawanna co., Penn., near the head of the Lackawanna river, and on the Delaware and Hudson railroad; 110 m. n.w. of Philadelphia; pop. '80, 7,714. The city was incorporated in 1851, and is in the midst of one of the most important coal-mining districts in the state.

CARBON DISULPHIDE, or BISULPHIDE, also called by workmen sulphur alcohol, a chemical compound produced by burning carbon in an atmosphere of sulphur, or by distilling certain metallic sulphides with charcoal. It is a colorless liquid, of specific gravity of 1.268, and boils at 114° Fahrenheit. It does not combine with water, but readily mixes with alcohol, ether, and other hydrocarbons. It readily dissolves India rubber, gutta-percha, resins, oils, camphor, phosphorus, sulphur, and iodine, and is very inflammable. With oxygen or atmospheric air it forms an explosive compound. It is of great use in manufacturing in many ways, such as vulcanizing India rubber, extracting fat from bones, dissolving oil from seeds, removing sulphur and bitumen from rocks, making pure spices, purifying paraffine; also for destroying vermin, producing artificial cold, making photographic light, cleaning greasy rags, preserving hides and fresh meat, and making delicate perfumes. It is also used to some extent in medicines. The odor of the crude article is most sickening. It has a high refracting power, and is used in prismatic glass bottles for producing, on a large scale, a spectrum, with an electric or a lime light.

CARBON'IC ACID, FIXED AIR, or CHOKE-DAMP, is a substance occurring free as a gas in the atmosphere, to the extent of 1 volume to 2,500 of air, and also in combination with a variety of substances. It is most easily prepared for experimental purposes from chips of marble, water, and hydrochloric acid, which are placed in a gas bottle with tubes. The hydrochloric acid (HCl) acts on the marble (CaO,CO_2), and forms chloride of calcium (CaCl), water (HO), and carbonic acid (CO_2), which escapes as gas with effervescence, and may be conducted by a proper tube under the mouths of jars filled with water and placed on a pneumatic trough. Where C. A. is required in large quantities, it is prepared in a leaden vessel from chalk (CaO,CO_2) and sulphuric acid (SO_3) diluted with water, when sulphate of lime (CaO,SO_3) is formed, and C. A. escapes as gas.

The atomic weight or equivalent of C. A. is 22; it is a clear, colorless gas, with a pleasant acidulous smell and taste. Under great pressure and cold, it can be condensed into a liquid, and even a solid resembling snow in appearance. Under ordinary atmospheric pressure, C. A. dissolves in water to the extent of 2 volumes of gas in 3 of water; but under increased pressure, a very much larger amount of gas is taken up by the water, and in this way the various kinds of AËRATED WATERS (q.v.) are prepared. The gas is more than half as heavy again as ordinary air, being 1529. It is incombustible, and a non-supporter of combustion, at once extinguishing a lighted candle, gas jet, or even a piece of burning phosphorus, when these are placed in a jar filled with the gas, or even in a mixture of C. A. and air. This power of putting out flame and fire has been turned to account in the extinguishing of burning coal-mines, where, all the openings to the mine being properly secured, C. A., in the form of the spent air from an ordinary coal-furnace, has been passed into the mine, with the result of successfully stopping the fire. It is irrespirable in a concentrated form, producing spasm of the glottis, which prevents the admission of the gas into the system; and when mixed with air, it can be breathed without suspicion, and then acts as a narcotic poison, even when present only to the extent of 4 or 5 per cent of the air. The deadly effects of C. A. are

observed, in the combustion of charcoal, coal, or *coal-gas*, in chauffers, furnaces, or in fireplaces with the dampers down, when the deadly fumes of C. A. steal more or less quickly over the inmates of the room, and they almost unconsciously become its victims—thus unknowingly following the course of the Parisian suicide, who purposely lights a charcoal fire in the center of his room, and prepares for death; and in overcrowded rooms where the C. A., exhaled from the lungs of each inmate at every breath, poisons the air of the apartment, and day by day slowly but surely robs the robust of health, and ultimately of life. In such cases as the Black Hole of Calcutta (q.v.), where there was scarcely any outlet for the poisonous gas, only a few hours may be required to complete the catastrophe.

Though poisonous when inhaled by the lungs, C. A. is rather refreshing when taken into the stomach. Thus, aërated beverages of all kinds—beer, champagne, and carbonated mineral waters—owe their refreshing and invigorating qualities to the presence of C. A.; and if the gas be allowed to escape, they become almost tasteless, stale, and mawkish.

Besides abounding everywhere in the atmosphere, C. A. is largely evolved from fissures in the earth, especially in volcanic districts. In the *poison or Upas valley* of Java, which is a valley of an oval form, about ¾ of a mile in circumference, and 30 to 35 ft. deep, the carbonic rises to a height of about 18 ft. from the surface, and the whole bottom of the valley is devoid of vegetable and animal life, and is strewn here and there with the bleached bones of man and other animals that have unluckily stepped within the deadly circle. A dog thrown in dies in 14 seconds; and birds attempting to fly across the valley, instantly drop down dead. In the neighborhood of the lake of Laach, in Rhenish Prussia, the amount of C. A. evolved every day has been estimated at 600,000 lbs. weight. In a state of combination, C. A. forms an ingredient in a great number of minerals called *carbonates*, such as chalk, limestone of various kinds (CaO,CO_2), black-band iron-stone (carbonate of iron, FeO,CO_2), malachite (carbonate of copper, $CuO,HO,+CuO,CO_2$), etc. C. A. is the principal product of combustion; the carbon of the burning substance (coal, candle, coal-gas, wood, paper, etc.) uniting with the oxygen of the atmosphere, and forming C. A. (CO_2). It is also a product of respiration (q.v.), and is evolved more or less largely by all animals, not only by the mouth, but in exhalations from the skin, and is present in blood, urine, etc. It is evolved during the fermentation (q.v.) of beer, wine, etc., and often remains in brewers' vats when the liquor has been drawn off. During the decay of vegetable and animal matter, C. A. is produced, and in explosions of fire-damp in coal mines, it is formed in large quantity, and fills the underground passages.

C. A. forms the largest ingredient in the food of vegetables, and is therefore abstracted in large quantity from the air by plants. It enters into combination with the majority of the oxides of the metals and other compounds, to form a class of salts called *carbonates*, several of which have been referred to. C. A. when present in a vessel in quantity may be recognized by the power of extinguishing a lighted candle, or by not burning itself. C. A. in the form of gas may be readily recognized in the atmosphere by exposing a little lime-water in a saucer, or other shallow vessel, when the lime (CaO) abstracting the C. A. (CO_2) from the air, a white film of carbonate of lime or chalk (CaO,CO_2) is formed on the surface of the liquid. A solution of baryta (q.v.) in water is more delicate in its action on the C. A. of the air, and more readily indicates its presence.

CARBONIC OXIDE is a compound of one atom of carbon and one atom of oxygen, is represented by the symbol CO, and has the atomic weight 16. It does not occur naturally, but may be observed burning with a pale-blue flame in fire-places and stoves, especially in frosty weather. During the combustion of the fuel at the lower part of the grate, the oxygen of the air unites with the carbon of the fuel to form carbonic acid (CO_2); and this gas rising up through red-hot coal or carbon (C), has part of its oxygen abstracted by the carbon, and two atoms of C. O. (CO) are produced, which, taking fire on the top of the coals, burn with the characteristic blue flame, abstracting more oxygen from the air, and re-forming carbonic acid (CO_2). C. O. can be prepared for experimental purposes by heating a mixture of oxalic acid (HO,C_2O_3) and sulphuric acid (SO_3) in a retort, when the latter abstracts the water from the oxalic acid, and the other elements (C_2O_3) escape as carbonic acid (CO_2), and C. O. (CO). On passing the mixed gases through a solution of potash (KO), the carbonic acid is retained as carbonate of potash ($KOCO_2$), whilst the C. O remains as gas. C. O. is a transparent, colorless gas, a little lighter than air, being 967, and has never been liquefied nor solidified. It burns with a blue flame, but is a non-supporter of combustion, and at once extinguishes a lighted candle introduced into it. It is very poisonous, and even when largely diluted with air, if inhaled, it produces a sensation of oppression and tightness of the head, and ultimately acts as a narcotic poison. It does not take part in any natural phenomena, nor is it put to any use in the arts and manufactures, and in these respects, affords a striking contrast to carbonic acid, which has so many duties to perform in nature and in the arts.

CARBONIF'EROUS LIMESTONE, or MOUNTAIN LIMESTONE, one of the lower rocks of the carboniferous system, generally of coralline formation, containing magnesia, and rich in organic remains. Some varieties make good building stone.

CARBONIFEROUS SYSTEM, the name given to the strata which, in geological order, rest upon the Devonian measures, and are capped by the Permian series. They derive their designation from the amount of carbon contained in them, for to them the great coal-fields of the world belong. In an economic sense, they are the most valuable series of rocks in the earth's crust, forming the great store-house from which is obtained the chief supply of coal, iron, and lime.

The rocks of the system are composed of a vast series of beds of sandstone, limestone, shale, and coal. In some coal-fields, these are so interstratified, that it is impossible to subdivide the strata in the order of time. In the Edinburgh district, there are nearly 100 coal-seams, omitting all under 6 in. in thickness. Out of the whole depth of the strata, amounting to about 6,300 ft., these seams occupy only 204 feet. The remainder consists of sandstone and shale in the upper half; towards the middle, limestones appear, and these increase downwards in the number and thickness of the beds, but are still intermixed with seams of coal. The same arrangement exists in the other coal-fields of Scotland, as well as in those of the n. of England. In other districts, the limestone is confined to the lower portion of the measures, and separated from the coal-bearing strata, so as to form a natural subdivision of the system into—1. *The coal measures*, consisting of shale, sandstone, and grit, with occasional seams of coal; and 2. *The mountain* or *carboniferous limestone*, a calcareous rock, containing marine shells and corals, and devoid of coal. A coarse quartzose sandstone, passing into conglomerate, is occasionally developed to a considerable extent between these two divisions. This is a local deposit, being almost confined to England, and may be considered as one of the coal sandstones, of coarser texture than usual. Being occasionally used for millstones, it is called *millstone grit*. It is accompanied with shales containing the usual coal plants, but generally without any true coal seams. Another locally developed series of beds, consisting of indurated shales, sandstones, and grits, occurs below the carboniferous limestone in South Wales and Ireland, and is known as the *lower limestone shales*. These rest conformably on a series of yellow sandstones, which have been generally referred to the Devonian measures, but which, from their organic contents, as well as from their stratigraphical position, seem to be basement beds of the carboniferous series. The existence and development of these various beds in the United Kingdom will be better understood by an examination of the following table. The maximum thickness of the beds is given in feet when known; the blanks show the absence of the division from the particular coal-field:

	Edinburgh.	Glasgow.	N. York.	Derby.	S. Wales.	Kerry.	Clare.	N. Ireland.
Coal Measures.....	6,300	2,800	2,000	2,700	12,000	2,000	2,000	2,200
Millstone Grit	. ..	....	400	1,600	1,000	....	....	1,800
Mountain Limestone ..	. .	....	1,659	1,000	1,500	1,500	3,000	6,400
Lower Limestone Shales		....	....	....	500	4,650	150	1,200
Yellow Sandstone	....	....	....	....	....	3,000	unknown depth	2,000

In the midland countries, the coal measures are the only portion of the C. S. present, and these rest on the Silurian or older rocks. In Devonshire, there occurs an extensive series of shales and sandstones, with a few beds of earthy anthracite or culm, associated with argillaceous rocks, probably belonging to the lower limestone shales, much indurated, and traversed by slaty cleavage.

From the great economic value of the contents of the C. S., we are better acquainted with its fossils than with any fauna or flora that flourished before the tertiary epoch. As coal is the result of the mineralization of vegetable matter, the coal measures must necessarily abound in the remains of plants. No less than 294 species have been described as found in Britain alone. Numerous impressions of plants, as well as traces of structure, are found in the seams of coal themselves; but the more distinct forms are preserved in the interstratified beds of mud and ironstone, often in great number and exquisite beauty. Such remains consist chiefly of impressions of leaves separated from their branches; of casts of trunks, more or less in a broken state; and of roots much compressed, yet occupying their original position in the clay soil now indurated into shale; with these occur pieces of wood, or remains of trees, in which the vegetable texture is to some extent preserved. The great proportion of the plants seem to have flourished in marshy swamps, and to have accumulated where they grew, like peat, the material afterwards converted into coal. Hence a stratum of shale in which are imbedded the roots of sigillaria, calamites, etc., is the invariable *floor* on which the coal seam rests. The chief coal plants are lepidodendron (q.v.), sigillaria (q.v.), calamites (q.v.), trigonocarpon (q.v.), and ferns (q.v.). The existence of cone-bearing trees during this epoch has been proved from the microscopic examination of prepared sections of fossil woods, in which the small discs occur that are characteristic of and peculiar to the coniferæ.

The animal remains are as numerous and as well preserved as the vegetable. They are found chiefly in the limestone; the greater part, indeed, of this rock, is made up bodily of corals and crinoids. No other such accumulation for extent and variety is known; it has its nearest parallel in the somewhat similar formation now going on in the southern archipelago. The corals and crinoids were specifically as well as individually numerous. The terebratulæ and other allied forms of bivalve shells, though belonging to a comparatively limited number of genera, were very abundant. The more highly developed mollusca were also numerous; they belonged to a great number of

generic types. But the most remarkable group was the fishes. At no time were they more abundant. They belonged to the ganoid and placoid groups of Agassiz. The ganoids, having their entire surface covered with scales, were numerous; some of them inhabited shallow water near the shore, and fed on crustaceans and shell-fish, for crushing which they had a formidable apparatus of conical teeth of a very complicated structure. Others were inhabitants of deep water, and were more powerful and predaceous, and more rapid in their movements. Their jaws were produced into a long snout, like the crocodile of the Ganges, and armed with a double series of enormous teeth, which were sometimes as much as 4 in. long by 2 in. broad, as in megalichthys (q.v.), dimensions rarely attained even by the largest known reptiles. Associated with these were a great number of sharks belonging to the cestraciontidæ (q.v.), a family of which we have only a single living representative. They were furnished with a long bony spine to strengthen the dorsal fin, and thus enable them to turn speedily in the water, as they required to do in seizing their prey. These spines are often found fossil. The only remains referred to a higher division of the animal kingdom yet found belong to the saurian archegosaurus (q.v.).

CARBONIFEROUS SYSTEM (*ante*). Most of the great coal fields of the world belong to this system of formation. In this country, coal is widely distributed over Pennsylvania, Ohio, Illinois, Kansas, Virginia, and other states. It is estimated that there are 400,000 sq. m. of the earth's surface now covered by productive coal fields. Now as there are about 3,100,000 sq. yards in a m., and as a cubic yard of coal weighs nearly a ton, and as in some of the fields the vein or deposit is from 30 to 60 ft. thick, there would not seem to be any immediate danger of failure in the supply of coal. See Anthracite, and Coal.

CARBON PRINTING. See Positive Printing.

CARBUNCLE, a name given by lapidaries to the beautiful mineral called *pyrope* (q.v.) by mineralogists. The C. of the ancients appears to have been either pyrope, or the deep-red variety of noble garnet (see Garnet), which is in every respect very similar to it, or probably included both.

CARBUNCLE (Lat. *carbunculus*, a little coal) derives its name from the two prominent symptoms—a glowing fiery redness, and a burning pain. It consists of an inflammation, caused by some vitiated condition of the blood, or some atmospheric influence, attacking a patch of skin on the shoulders, nape of the neck, or indeed on any part of the body. The part swells slightly, feels hard, and this hardness extends deeply into the tissues; the pain is very severe, and the patient much depressed with loss of appetite, and general derangement of the secretions. As the disease advances, the redness assumes a dark purple or livid hue, the cuticle rises in blisters, and many small specks of matter appear on its surface, which discharge, and leave apertures like those in the rose of a watering-pot; through this a thin viscid fluid escapes, and occasionally a small slough or core of the true skin which has been killed by the disease. Sometimes these apertures meet, forming large openings, and in others the whole patch of skin sloughs and comes away.

The treatment of C. consists in restoring the secreting organs to a healthy condition, the agents for which must depend on the individual case; in supporting the patient's strength by easily digested food, wine, brandy and bark, with nitric acid; relieving pain by opiates, and encouraging suppuration with warm poultices; carrot, turnip, and yeast poultices being favorite applications in this disease. To prevent excessive loss of skin, the C. must be divided freely with a knife from one margin of the inflamed patch to the opposite one.

CARBURETS. See Carbides, *ante.*

CARBURETED HYDROGEN is a term in chemistry applied to several compounds of carbon and hydrogen. Thus, light carbureted or monocarbureted hydrogen (CH_2) is the gaseous compound popularly known as marsh gas and fire-damp, and is the principal constituent of coal-gas. See Gas. Heavy carbureted or bicarbureted hydrogen (C_2H_2) is otherwise known as olefiant gas (q.v.).

CARCAJENTÉ, a t. of Valencia, Spain, about 28 m. s.s.w. of the city of Valencia, situated on a rich plain near the right bank of the Juncar. It is well built, with good streets, and has a palace belonging to the marquis of Calzada. It has some manufactures of linen and woolen, and a trade in the agricultural produce of the district. Pop. about 7,000.

CARCANET, a jeweled chain or necklace. Venice was famous for the manufacture of carcanets in the 15th century.

CARCASS, in military pyrotechny, is a hollow case of iron, sometimes globular, and sometimes ovate, filled with combustibles. It is fired from a mortar. Its chief use is to ignite buildings in the enemy's quarter, and to give sufficient light to aim the shot and shells. Carcasses are said to have been first used by one of the princely ecclesiastics of Germany, the bishop of Munster, when he fought against the duke of Luxem-

bourg at Groll, in 1672. The oval carcasses, being uncertain in their flight, are now nearly abandoned. The round carcasses now made are chiefly those here indicated:

Diameter.	Composition.	Weight.
13 inch.	18 lbs.	213 lbs.
10 "	7 "	100 "
8 "	3 "	51 "
5 "	19 ozs.	17 "
$4\frac{2}{5}$ "	7 "	9 "

Carcasses are not intended to burst, but to send out, through holes, a furious and inextinguishable fire, which lasts from 3 to 12 minutes. The composition with which they are filled consists of saltpeter, sulphur, meal gunpowder, pitch, rosin, tallow, and Venice turpentine, about half being saltpeter. The composition is packed in tightly through one of the holes; and the holes are stopped with fuses adjusted to ignite the composition after a certain space of time. Sometimes old pistol barrels, loaded to the muzzle, are introduced with the composition. Compare those details with CASE-SHOT, and SHELLS.

CARCASSONNE, a t. in the department of Aude, France, situated on the river Aude, and the *Canal du Midi*, about 55 m. s.e. of Toulouse. It is divided into two parts, the old and new towns. The modern town is well built, with streets running at right angles to each other, squares adorned with trees, pleasant boulevards, and several marble fountains. The old town, built on a height, is much more picturesque, with its ramparts and towers, some parts of them dating from the time of the Visigoths, and the rest, with the castle, from the 11th or 12th century. This old town suffered greatly at the hands of the fierce bigot Simon de Montfort and his crusaders, who here burned 400 of the Albigenses. In the 14th c. it effectually resisted the black prince. The cloth manufactures are important, employing, it is said, upwards of 7,000 people. C. has also manufactures of paper, leather, linen, and soap. Pop. '76, exclusive of garrison, 23,517. The ancient name of the town was Carcaso, which was a place of some note in the time of Cæsar.

CARCHARIAS. See SHARK.

CARCHEMISH. See page 889.

CARCINO'MA. See CANCER, *ante.*

CARDAMINE. See CRESS, BITTER.

CARDAMOMS are the capsules of certain species of plants of the natural order *scitamineæ* (q.v.), and belonging to at least two genera, *amomum* and *elettaria.* They are three-celled, and contain numerous wrinkled seeds, which form an aromatic pungent spice, weaker than pepper, and with a peculiar but agreeable taste. On account of their cordial and stimulant properties, they are employed in medicine, very generally to qualify other medicines; they are also used in confectionery, although not to a great extent in Britain; but in Asia they are a favorite condiment; and in the n. of Germany, they are used in almost every household to flav or pastry.—The C. recognized in the British pharmacopœias, and called *true* or *officinal C.*, also known in commerce as *Malabar C.*, are the produce of *elettaria cardamomum*, a native of the mountains of Malabar and Canara. They depend for their qualities on a peculiar pungent essential oil, called *oil of cardamom,* which may be obtained from them by distilling them with water, and when fresh, is colorless. Other kinds of C. occur in commerce, but none is equal to the true C. in commercial value. The different kinds of C. differ not only in strength, but in the character of their aroma. The plants producing them have much general similarity.

CARDAN, JEROME, a celebrated mathematician, naturalist, physician, and philosopher, b. at Pavia, Sept. 24, 1501, was the illegitimate son of a physician and jurisconsult at Milan. He received his early education at home, and completed his studies in Pavia and Padua. After some years, he became professor of mathematics at Milan. Here his reputation began to grow. After a few years, he began to lecture on medicine, to the practice of which he ultimately betook himself. By 1546, his reputation had so increased, that he was invited by the king of Denmark to accept a professorship at Copenhagen, which, however, he declined; and, in 1552, we find him proceeding to Scotland, on an invitation from Hamilton, primate of that country. He managed to cure the primate of an inveterate asthma, which had defied the skill of the most celebrated physicians, and returned to Milan enriched by the bounty of his patient. Here he again settled for some time. In the autumn of 1559, however, he removed to Pavia as professor of medicine, whence, again, in the same capacity, he removed to Bologna, where he continued teaching till 1570, when we find him imprisoned for debt. Having regained his liberty in 1571, he went to Rome to avoid his creditors. Here he was speedily admitted a member of the medical college, and pensioned by pope Gregory XII. The rest of his life he spent, without public employment, in Rome, where he died Sept. 2, 1576, a few weeks after finishing his autobiography. Some writers assert, but on no sufficient authority, that he starved himself to death, to fulfill a prediction which he had made as to the time when he should die. It is certain, however, that he was a devoted astrologer, and cast horoscopes for himself and others. The fancifulness necessary to

support the faith of an astrologer imbued all his scientific writings. These were very voluminous. A summary of his notions on physics and metaphysics is given in his two works—*De Subilitate*, in 21 books, and *De Rerum Varietate*, in 17 books. On the whole, he wrote 122 treatises on physics, mathematics, astronomy, astrology, rhetoric, history, ethics, dialectics, natural history, music, and medicine. These, it need scarcely be said, abound in incoherent paradoxes, contradictions, and capricious abstractions, more than enough to overwhelm the few profound ideas which he originated. A formula for the solution of certain kinds of cubic equations is called "Cardan's formula," and was published by him, as his own invention, in the *Ars Magna sive de Regulis Algebraicis* (1545); but it would appear that the formula was really the invention of one Tartalea or Tartaglia. In religion, C. was heterodox, and commonly reputed an atheist. His numerous writings were collected and edited by Charles Sphon (10 vols., Lyon, 1663).

CARD-BOARD, or CARD, is made by pasting together several layers of paper, according to the thickness and quality required. *Bristol-board*, used by artists, is made entirely of white paper; ordinary card-board, of fine white paper outside, with one or more sheets of coarse cartridge-paper between. According to the number of layers, they are called *three*, *four*, *six*, or *eight sheet* boards. *Mill-board*, used by book-binders as the basis of book-covers, is made of coarse brown paper, glued and strongly pressed.

The workman arranges the paper in the order required for pasting, and the pile, called a *head*, is placed at his left hand, the paste-tub on his right. He lifts a sheet from the head with his left hand, brushes it over with paste with his right; then another is laid upon that and pasted, until he comes to the last required to complete the thickness of one board, when he removes two sheets, and only pastes the upper one, which thus forms the lower sheet of another board. This is repeated till the whole head is pasted, when it is removed to a press, and the water of the paste squeezed out at the edges. The boards are then separated, and dried by hanging them in a room artificially heated. The card-board, which is now rough and warped, is smoothed and flattened by making a pile consisting alternately of sheets of rough card-board and copper plates, with a copper plate at top and bottom. This pile is passed between iron rollers, and the smooth surface of the copper impressed upon the card-board, which is thus flattened and beautifully polished.

The enameling of address-cards is produced by brushing over the card-board a mixture of *china* or *kremnitz white* (a fine variety of white lead) and size. After drying, this surface is rubbed lightly over with a piece of flannel, previously dipped in finely powdered talc; it is then polished by rubbing vigorously with a hard, close-set brush.

CAR'DENAS, a seaport and city of Cuba, capital of a district, 105 m. e. of Havana, on a bay of the n. coast, and having railroad communication with Matanzas and Havana. There is good anchorage in the harbor. Sugar is the chief article of export. Pop. 11,000. The streets are well laid out and lighted, and the houses are usually neat and solid. There is a bronze statue of Columbus in one of the squares. Much of the business is done by people from the United States, a fact that gives it the name of the "American city." In 1850, the city was plundered by Lopez.

CARDIA, the upper orifice of the stomach, called, on account of its vicinity to the heart, by the same Greek name, *cardia*, and probably hardly distinguished from it in the earliest times of Greek medicine.

CARDIAC MEDICINES, stomachic and stimulating remedies—cordials, so called from their action on the heart through the stomach. See CARDIA.

CARDI'ADÆ, a family of bivalve lamelli branchiate mollusks, of which the cockle is a specimen.

CARDIALGIA, pain of the heart or stomach (CARDIA). The name is commonly applied to the particular variety of pain called *heartburn*, arising from a disordered stomach, and accompanied with acid eructations. See INDIGESTION.

CARDIFF (*Caer-Taff*, Fort of the Taff), a parliamentary and municipal borough and seaport, one of the county towns of Glamorgan, South Wales, situated on the river Taff, 170 m. w. of London by railway. The population has risen from 2,000 in 1801, to 85,378 in 1881, with a floating population of about 5,000. C., with Cowbridge and Llantrissant, returns one member to parliament. The town extends about one mile in each direction from the town-hall. Among the public buildings are the Glamorganshire and Monmouthshire infirmary, town-hall, free library and museum, county jail, law-courts, an infirmary, a county lunatic asylum, baths, and a theater. There are also many private buildings of a superior character, and a public park. Of about 30 places of worship in C., only 4 belong to the church of England. South Wales College is at C.

The port of C. is the outlet for the large mineral and manufactured produce of the central portion of the South Wales mineral-field, in which are the populous districts of Merthyr-Tydvil, Rhymney, Aberdare, and the Rhondda valley, with which this port is connected by the Taff Vale, the Rhymney, and the Ely Valley railways, and the Glamorganshire canal. The town is also one of the chief stations on the Great Western line from London to Milford-Haven. The Bute docks, e. and w., with an area of 76 acres, constructed at the expense of the Bute estate, have cost upwards of a million sterling, and belong entirely to the present marquis. There are about 40 staiths on the

quays of the docks, with machinery of a peculiar construction for the purpose of loading vessels with coal, by which the breaking of the coal is almost entirely prevented. Each of these staiths is capable of shipping 560 tons of coal in a day of 12 hours. There is also a tidal harbor, with 7 staiths, each capable of shipping 400 tons of coal per day, and a lower-water pier 1400 ft. in length. Height of water at spring-tide, 31 ft. 8½ inches; at neap-tide, 21 ft. 7½ inches. Width of sea-gates, 55 ft.; length of quays, 11,100 ft.; width of dock, 300 ft. southern, and 500 ft. northern part; depth, 25 feet. Exports during 1873—coal, 3,591,218 tons; iron, 154,570 tons; coke, 1276 tons. The quantity of coal exported has immensely increased. In 1880, 13,331 vessels, of 3,940,170 tons, entered the port, and 13,479, of 4,140,701 tons, cleared it. The imports to C. include copper ore, live cattle, salted provisions, foreign fruit and vegetables, corn and flour, etc. The Penarth docks, about 3 m. to the westward, form another outlet for the trade of the district. Steamers ply between the port of C. and New York, London, Liverpool, Glasgow, Bristol, Cork, Whitehaven, and Burnham.

The assizes (half-yearly, alternately with Swansea) and the quarter-sessions are held at the town-hall. The ancient city of Llandaff, now a mere village, is almost connected with Cardiff. Cardiff castle, built in the 11th c., is partly now in ruins, and partly occupied by the marquis of Bute, to whom nearly the whole of the modern town belongs. Robert duke of Normandy, brother of Henry I., died in the castle, after being a prisoner for 28 years. Cromwell (1648) got possession of the castle by treachery, after bombarding it three days; and he afterwards hanged the traitor, as an example to his own soldiery. This town was anciently an important one, successively under the British, Romans, and Normans.

CARDIFF GIANT, a rude statue of a man 10½ ft. high, cut (in Chicago) from a block of gypsum sent from Iowa. It was secretly buried near the village of Cardiff, Onondaga co., N. Y., where it was pretended to have been found in Oct., 1869, and was exhibited with great success for several months as "the petrified giant," deceiving even some men of science. The fraud, one of the most notable in recent times, was finally confessed.

CARDIGAN (anciently, *Aberteifi*, Mouth of the Teify), the co. t. of Cardiganshire, a parliamentary and municipal borough and seaport, in the s.w. corner of the county, on the right bank of the Teify, 3 m. from its mouth, and 239 m. n. by w. of London. The vicinity exhibits romantic scenery on the Teify, and grand rocks on the coast. The streets, except the chief one, are narrow and steep, the houses built of slate-rock. Pop. of the municipal borough, '71, 3,461; of the parliamentary borough, 4,939. With Aberystwith, Lampeter, and Adpar, C. returns one member to parliament. In 1875, 983 vessels, of 31,486 tons, entered and cleared the port. The general trade is confined to vessels of 20 to 100 tons. Vessels of 400 tons reach the town by spring-tides. C. became an important town about the Norman conquest. The Normans were frequently defeated before mastering it. There are the remains of a castle on a low cliff on the Teify, which is supposed to have been founded, in 1160, by a Norman baron. The town suffered much in the struggles between the Welsh and the Normans. The Teify is said to have been the last British resort of the beaver.

CARDIGAN, James Thomas Brudenell, 7th earl of; also baron Brudenell, lieut.gen.; 1797–1868. He was educated at Oxford, and went into parliament in 1818. In 1824, he entered the army in the hussars, and rose (1832) to be lieut.col. He was overbearing and quarrelsome, and treated his men with great severity, so that out of a regiment of 350, he made within two years 700 arrests, and held 105 courts-martial. In 1837, he succeeded to the peerage. In 1840, he fought a duel with capt. Tuckett, an officer of his regiment, in which his adversary was wounded. The house of lords subjected the earl to a show of trial, and he was acquitted. The Crimean war sent him to the field as commander of the light cavalry, and he led that body of 600 through the desperate charge at Balaklava, cutting his way through six times the number of Russian heavy cavalry, but leaving half his men dead or wounded on the field. This charge, celebrated in Tennyson's poem, was desperate and brilliant work, but in the opinion of many critics a wanton and needless sacrifice of his men. In 1861, he was made lieut. gen. He left no children, and the titles passed to his relative, the marquis of Ailesbury.

CARDIGAN BAY, a semicircular bend of St. George's channel, on the w. coast of Wales, 45 m. wide from n. to s., and 20 m. deep, with a sweep of coast of 110 miles. Its exterior points are Brach-y-Pwll, off which lies Bardsey isle, in Caernarvon, and Sturm Head, in Pembroke. It receives the rivers Mawddach, Dovy, Ystwith, Yren, and Teify. It has 3 to 30 fathoms water, with three reefs. A strong current sweeps round the bay from s. to north. Almost all the harbors on the coast are obstructed by bars. A great part of C. B. is said to have been once dry land, protected, as Holland now is, by dams and dikes, and containing 16 towns, and the land is said to have been submerged about 520 A.D.

CARDIGANSHIRE, a maritime co. in South Wales, on Cardigan bay, with an area of 675 sq.m., a half being waste. The surface is hilly, interspersed with fertile valleys. A rugged, bleak range of hills runs through the middle of the co., from the s.w. to the n.e., between the coast and the Teify, ending abruptly in a shelving beach in the middle

of the coast, but on other parts there are rich flat tracts. The co. contains little wood. The chief rivers are the Teify, which rises in a small lake near the center of the co., and runs 70 m. s.e. and e. along the s. border of the co., the Claerwen, Ystwith, and Rheidol. C. contains some romantic water-falls, especially the Rheidol falls and the Devil's bridge, and above 20 small lakes or llyns, noted for their wild beauty. C. reposes on lower Silurian slates and shales, containing few or no organic remains. Rich veins of copper, lead, zinc, and silver occur. The climate is cold and wet, but mild though wet on the coast. Snow lies long on the hills in winter. Summer is delightful in the valleys. C. is an agricultural co., and its chief branch of industry is the rearing of live-stock. The chief crops are oats, barley, and potatoes on the poor clay and peat soils of the mountains, and wheat, barley, and potatoes on the flat loams of the coast and valleys. The cattle and horses are small. There are some manufactures of coarse woolens and gloves, stockings, and hats. Oats, barley, cattle, sheep, pigs, butter, slates, and woolens are exported. Cardigan is the co. town; the other chief towns being Aberystwith, Lampeter, Adpar, Aberayron, Tregaron. C. sends one member to parliament. Pop. '71, 62,712; registered electors, 5,554. In 834, the king of C. became king of all Wales, under the title of Roderick the great. He divided Wales among his three sons. After this, the Danes and Normans overran Cardiganshire. The co. has many remains of British and Roman camps and roads, Druidical circles, cairns, and castles. Many Welsh princes and bards were buried in the abbey of Strata Florida, 16 m. s.e. of Aberystwith, and some of the records of the principality were kept here. In C. there is a curious practice of sending presents (*biddings*) to a new-married couple, which, when sold, often realize £50 or £60. C. was disturbed, 1843–44, by the Rebecca riots.

CARDINAL (Lat. *cardinalis*, principal, from *cardo*, a hinge). Cardinals are the highest dignitaries in the Roman church after the pope, whose electors and councilors they are. The title, however, had at first a more general application. The pope being the sovereign bishop over the whole Romish church, and having, as such, many duties to fulfill inconsistent with those of a particular diocese, had, from very early times, a number of bishops, priests, and deacons whom he appointed his vicars and coadjutors for the management of the diocese of Rome. The bishops exercised the episcopal function in the pope's stead, each having a peculiar church within the diocese. The priests were titular parsons of the churches in the city of Rome, and had the cure of souls. The deacons had charge of some churches and chapels of devotion, which they held as deaconries, with the additional duty of assisting the pope when he officiated in public. These three classes of ecclesiastics were called *cardinati* or *cardinales*, to denote that they were the first or chief over the rest, and that all the affairs of the diocese of Rome were under their direction. At a subsequent period, the priests and deacons of other cities of importance assumed the title of C., to distinguish them from other priests and deacons over whom they claimed supremacy; but the popes subsequently ordained that none but those whom they had chosen should be honored with that title. Amongst those whom the popes thus appointed were the seven bishops *suburbicarii*, who took their titles from places in the neighborhood of Rome. These bishops were called *hebdomadarii*, because they attended the pope for a week each in his turn. These cardinals took part with the Roman clergy in the election of the pope, who was generally chosen from their number. About the beginning of the 12th c., the popes having formed a regular court, began to bestow the rank of C. priest or C. deacon on any individual of the clergy, or even of the laity, whom they chose to select; and to each, whether Roman or foreign, they gave the title of some particular church in Rome, but without attaching to it any obligatory service. Thus the cardinals became a separate body elected for life and the officiating priests of the Roman parishes were gradually deprived of the title. In 1159, Nicholas II. limited the right of election to the popedom to the cardinals thus appointed, leaving to the rest of the clergy and people of Rome merely the right of approving of the election of a new pope, and to the emperor that of confirming it. Even these prerogatives, in course of time, were withdrawn. Notwithstanding the great powers thus intrusted to them, the bishops in the great councils of the church continued to take precedence of the cardinals; and it was not till 1614 that Louis XIII. of France, in the sitting of the parliament of Paris, adjudged precedence to the cardinals over the ecclesiastical peers—bishops and abbots. The power of the popes to appoint cardinals has often been contested, and their right to precedence denied, by the other dignified ecclesiastics. In 1567, pope Pius V. forbade any clergyman not appointed by the pope to assume the title of C.; and Sixtus V., in Dec., 1586, fixed their number at 70—viz., the 6 bishops suburbicarii, 50 priests, and 14 deacons, and on this footing they have since remained, though the number is seldom complete, the pope generally leaving some vacancies for extraordinary cases. The number has frequently fallen greatly under 70. When Nicholas III. was chosen pope, there were but eight cardinals; and a little before the death of Alexander IV., there were but four. Sometimes before Sixtus V. the number was exceeded, as in the pontificate of Pius IV., when there were 74. The body of cardinals is styled the sacred college. Most of the cardinals reside in Rome, and either enjoy ecclesiastical benefices, or are employed in the administration. When not so provided for, the cardinals receive an allowance of 100 dollars monthly from the papal treasury. Some cardinals belong to monastic

orders, and reside in their convents even after their election. The jurisdiction of the C. bishops in the place in which they are established is truly episcopal, but they are not obliged to reside. That of the C. priests and deacons is almost episcopal, but extends no further than the church and sacristy. They have there an episcopal seat under a canopy, like bishops, and they there solemnly give the people their blessing. The creation of cardinals is wholly in the pope. If the new-created C. is at Rome, he goes the same day to visit the pope, who puts the red cap on his head. The red hat, which Innocent IV. ordained that cardinals should wear, to show that they ought to expose themselves to the shedding of their blood in the cause of the church, is afterwards given in a public consistory. A number of symbolical ceremonies accompany this investiture. The cardinals that are absent, when chosen, have the cap sent them by a special messenger from the pope. The hat is given by the pope's own hands; and many cardinals who do not visit Rome, die without ever having received it. The only exception is in favor of members of royal houses, to whom the hat is sent. Pope Urban VIII., in 1630, gave to the cardinals the title of eminence, which they shared with the grand-master of the order of Malta, and the ecclesiastical electors of the German or Roman empire. The pope often employs cardinals as ambassadors, and the individual thus employed is styled legate *a latere*. A C. legate acts, or recently acted, as governor of the northern provinces of the Papal states, which thence received the name of legations. The chief secretary of state, the *camerlengo* or minister of finances, the vicar of Rome, and other leading officials, are always chosen from among the cardinals. The council of cardinals, when assembled under the presidency of the pope to discuss matters of church and state, is called the consistorium. There are public consistories, which are held on great occasions, and correspond to the levees of other sovereigns; and private and secret consistories, which are the privy council of the pope. Moreri's *Dictionary, voce Cardinal*, contains a list of cardinals from 1119 to 1724, with their names, countries, etc., and the dates of their election and death.

CARDINAL BIRD, or Red Bird, *Guarica cardinalis*, also called cardinal finch, cardinal grosbeak, and Virginian nightingale, one of the finest song-birds of America, belongs to the family of *fringillidæ*, and differs from the true grosbeaks (*coccothraustes*) in having the beak slightly bulging. The general color of the male is red, the head being vermilion, and only a small portion of the plumage around the base of the bill being black. The feathers of the crown are long, and erected into a conical crest, like a red cap. The C. B. abounds in Texas, Florida, and the southern states of America generally, migrating northwards in spring, but never further than Massachusetts, where only a few stragglers are seen. Its loud, clear, sweet, and varied song is to be heard chiefly in the mornings and evenings. In size it exceeds any of the British *fringillidæ*, being about equal to the starling.

CARDINAL FLOWER. See Lobelia.

CARDINAL POINTS. See Compass, Mariners'.

CARDINAL VIRTUES (Lat. *cardinalis*, chief, from *cardo*, a hinge). The C. V. of the ancients were justice, prudence, temperance, fortitude. They were so called because the whole of human virtue was supposed to hinge or turn upon them. In other words, they were considered as a full and comprehensive classification of man's various duties.

This mode of dividing the virtues is to be found as far back as Socrates. The ancient moralists treated under ethics the whole sum of human duty and virtue. Thus, Aristotle considers the great problem of the science to be the determination of man's highest good, together with the means of realizing it. Hence, he includes both the social virtues and the prudential regard to the welfare of the individual in the same scheme. Of the four C.V., it will be seen that the first, justice, is the social virtue; that prudence (which, properly speaking, includes temperance also) regards the well-being of the individual; while fortitude is necessary to both. This last was a virtue greatly esteemed in the ancient world, each one's lot being much less secure than with us in the present day; it was impossible to say what sufferings might be in store for the most prosperously situated of men.

Dr. Whewell has made an attempt to correct the more obvious defects of the classification, and has substituted one which he deems free from those defects. The most notable omission, in the ancient scheme, judged from the modern point of view, is the absence of all reference, either expressly or by implication, to the virtue of goodness or benevolence. This was characteristic of the pagan moralists; for although good deeds were abundantly practiced among the ancients, they did not account it a part of human virtue to flow out spontaneously in every kind of active benevolence, including the most wicked and worthless among the objects of it. Aristotle, in discussing the various acts and outgoings of friendship, never loses sight of the *reciprocal* obligations on the other side; so that when a rich man befriends, with his wealth, one that is poor, the inequality must be made good by a greater amount of honor or respect on the part of him that is so befriended.

Accordingly, to adapt the classification to the altered point of view, benevolence has to be added to the list. This is Dr. Whewell's first virtue; the others are justice, truth, purity, and order. But the scheme, as thus amended, is scarcely less objectionable than before. The virtue named last, order, which means obedience to authority, cannot but

contain a very large portion of all the rest; seeing that justice, truth, etc., are enjoined by positive law. Then, what is understood by purity, including the control of the two powerful appetites, hunger and sex, is partly prudential and partly social.

The ethical discussions of modern times may be very much aided, if we divide the totality of human virtue on the following plan. There are three distinct classes of human actions, which are all approved of or accounted virtuous, but on different grounds, and in a different manner.

1. There are actions which are forbidden by society under penalties; in other words, men are punished for committing them. Such are theft, breach of bargain, slander, violence to the person, and all the offenses against our fellow-men that are prohibited by the law of the land. The avoiding of all these actions is signified to be a part of our duty, by the suffering inflicted on the doers of them. The law fines, imprisons, or puts to death those who will not conform to its regulations.

The law of the land is not the only power that prescribes conduct enforced by penalties. The public opinion of the country at large forbids certain actions, and punishes transgressors by excluding them from social intercourse; such, for example, are acts of unchastity, more especially when committed by women. There are also codes enacted by particular societies, as the code of honor among gentlemen, which constitutes some actions offenses that are not so by law, or by universal opinion. Cowardice is one of the qualities most obnoxious to the code of honor.

The actions prohibited by law are obviously such as could not be allowed without the entire subversion of human society. If murder and theft were to go unpunished, the principal end for which men associate together in communities—that is, protection and security—would not be attained. It is impossible that we should not disappove of all such actions, and approve of the contrary.

2. There are some actions that are accounted virtuous, while their opposites are not punished, as in the case of those now mentioned. Doing good to persons that have no claim upon us—in other words, benevolence or philanthropy—is considered highly praiseworthy; but the neglecting of this is not usually visited with any punishment or censure; so that if it be a duty to perform acts of benevolence, it is a duty generically different from paying our debts, and respecting the person and property of our neighbor. The motives brought to bear on the two cases are widely contrasted: in the one, we *punish* for doing the action forbidden; in the other, we *reward* for doing the thing enjoined, and inflict no punishment if that is neglected. Here lies the difference between *duty*, strictly so called, and *merit*. In the bare performance of duty there is no merit; a man would not even be commended for the punctual payment of his just debts, if it were not that many people are deficient in this respect, and in the comparison with these the correct person excites in our minds a feeling of satisfaction. *Disapprobation* is the sentiment properly concerned with duty, or rather, with breach of duty; *approbation* is bestowed on all who do something over and above their duty. This distinction is known in every department of practical life; while speculative moralists habitually lose sight of it.

3. The virtues included under prudence are in a different position from either of the foregoing classes. Bearing the common names, virtue and duty, by which they are recognized as worthy of approbation or commendation, they are nevertheless unaccompanied with the sanctions either of punishment or of reward. The imprudent man is subject to no legal penalty, unless he clearly involves other persons in his imprudence; and the prudent man is not rewarded with the praise, esteem, or other benefits conferred upon the benevolent man. It is true that the young are punished by parents or teachers for imprudences; and some governments take such a paternal care of their subjects, as to punish them for sins against themselves. Men have been sent to prison, because of their endangering their own salvation by embracing heresy; but at the present day, such a proceeding is considered beyond the function of government. Men and women, arrived at maturity, are expected to take care of their own interests; even if they do not, no one punishes them; if they do, no one rewards them. We have, it is true, a certain feeling of disesteem in the one case, and of esteem or commendation in the other; neither of which, however, attains any considerable strength until more than the individual's self is involved. In short, although we cannot divest ourselves of all sentiment as lookers on, when men behave prudently or imprudently, our rule is *non-interference;* and this constitutes a marked distinction between the self-regarding and the social vices and virtues.

Accordingly, when ethical writers are endeavoring to probe the foundations of the moral sense in man, they ought to consider separately those three different species of conduct, for the sentiment excited by each is marked by strong peculiarities. To class social duties enforced by punishment, social virtues stimulated by rewards, and prudence, which is accompanied by neither, under one common designation, and discuss them as if they were essentially the same, is to confuse, instead of clearing up, the first principles of morality.

In Roman Catholic systems of theology, there are declared to be four *cardinal virtues* —"prudence, fortitude, temperance, and justice"—from which all other "moral" virtues are represented as flowing. But there is a prior division of virtues into the two classes of *theological* and *moral;* the theological virtues being faith, hope, and charity.

The distinction between these two classes is represented as consisting in this, that the theological virtues "*immediately* regard God;" and the moral virtues do not immediately regard God, but are commanded and rewarded by God, and are beneficial to ourselves.

CARDING OF COTTON, etc., the process of disentangling and arranging in parallel rows the fibers of cotton. This operation may be compared to the combing and brushing of one's hair, and the *card* combines the properties of the comb and brush, being a brush with wire teeth instead of hairs. These teeth are inserted in strips of leather which are fixed upon the surface of a cylinder. Several such cylinders are arranged so that the ends of the teeth are nearly in contact; and the cotton being brought to them, is caught up, passed from one to the other, and combed out as the cylinders revolve in the form of beautiful films or fleeces, which are removed by a smaller drum-card, called the "doffer," and again from this by the "doffing-knife." These films, which are of the width of the drum, are next contracted to a narrow ribbon, by being passed through a funnel; and thus narrowed, are called the "card ends" or "slivers," and are now ready for the next process of "drawing" or "doubling. See SPINNING.

CARDINIA, a genus of fossil conchiferæ, containing 85 species, which extend from the Silurian to the inferior oolite. They have an oval or oblong shell, attenuated posteriorly, and marked with lines of growth, and an external ligament. They occur abundantly in the valuable layers of clay-ironstone called "mussel-bands." In Derbyshire, this material is wrought, like marble, into vases.

CARDI'TIS, or inflammation of the heart, a form of disease of very rare occurrence, if the term be limited in its application to cases of true acute inflammation of the muscular structure of the heart itself. C., however, was commonly understood in a wider sense, so as to include certain forms of disease of the external and internal lining membrane of the heart; and it is only since the beginning of the present century that, owing to the improvements in medical pathology and diagnosis, the names of pericarditis and endocarditis (q.v.) have come prominently into view as indicating the most ordinary inflammatory affections of the heart. See HEART, DISEASES OF THE.

CARDIUM AND CARDIA'CEÆ. See COCKLE.

CARDO'NA, a t. of Catalonia, Spain, about 44 m. n.w. of Barcelona. It is situated on a declivity on the right bank of the Cardener, is surrounded by walls, pierced with six gates, and commanded by a castle on a height. It is celebrated on account of a mountain of salt in its vicinity, which has a height of about 500 ft., and measures a league round. When the sun shines on this gigantic mass, the effect is of the most brilliant and gorgeous description. Pop. about 2,500.

CARDOON', *Cynara cardunculus,* a perennial plant of the same genus with the artichoke (q.v.), a native of the s. of Europe and the n. of Africa. It very much resembles the artichoke, but is of larger size, whilst the flowers (heads of flowers) are smaller. It has long been in cultivation, for the sake of the blanched leaf-stalks and midribs of the leaves, which are used as a salad, or more generally as a boiled vegetable during winter.

CARDS. All that we know of C., for certain, is, that they are of ancient and eastern origin. What is asserted by count de Gebelin and the earliest writers upon the subject, that in their primary stage they constituted some sort of symbolic and even moral game, is not so well established. The Hindu and Chinese C. are, however, emblematic in a very high degree—the former illustrating the ten avatars, or incarnations of the deity Vishnu; and the so-called paper-tickets of the Chinese typifying the stars, the human virtues, and, indeed, almost anything you please. The learned sir William Jones expresses himself convinced that the Hindu game of *chaturaji*—the four rajahs or kings—a species of highly, complicated chess, was the first germ of that parti-colored pasteboard which has been the ruin of so many modern fortunes. In the wardrobe accounts of Edward I., there is an item of money paid for the use of that monarch for playing at the four kings—"ad opus regis ad ludendum ad *quatuor reges,* viii.*s.* v.*d.*"—which is supposed to have been a game at C.; but how and when painted C. took the place of carved figures, is still but matter of conjecture.

A pack of Hindustani C., in the possession of the royal Asiatic society, and presented to capt. Cromline Smith in 1815 by a high-caste Brahman, was declared by the donor to be actually 1000 years old. "Nor," quoth the Brahman "can any of us now play at them, for they are not like our modern cards at all." Neither, indeed, do they bear any remarkable resemblance to our own—the pack consisting of no less than eight suits of divers colors, the kings being mounted upon elephants, and the viziers, or second honors, upon horses, tigers, and bulls. Moreover, there are other marks by which the respective value of the common C. may be distinguished, which would puzzle our club quidnuncs not a little—such as "a pine-apple in a shallow cup," and "a something like a parasol without a handle, and with two broken ribs sticking through the top." In the Chinese dictionary, called *Ching-tsze-tung,* it is asserted that dotted C. were invented in the reign of Seun-ho (1120 A.D.), and devised for the amusement of his numerous wives; there are 30 C. in each of these packs, 3 suits of 9 C. each, and 3 single C. superior to all the others. The name of one of the suits is *Kew-ko-wan*—that is to say, the nine ten-thousands of kwan, strings of beads, shells, or money; and the titles of the other two suits are equally con-

cise and significant. The Chinese C. have, however, a decided advantage over those of Hindustan in being oblong instead of circular.

C. do not appear to have been known in Europe until towards the end of the 14th century. "In the year 1379," writes Carelluyzo, "was brought into Viterbo the game at cards, which comes from the country of the Saracens, and is with them called *naib*." "Whence afterwards," says Mr. W. Chatto (*Origin and History of Playing Cards*, Lond., 1848), "perhaps Jackanapes, Jack of cards." This entry occurs in the accounts of the treasurer of Charles VI. of France, in 1393: "Given to Jacquemin Gringonneur, painter, for three packs of cards, gilt and colored, and variously ornamented, for the amusement of the king, 56 sols of Paris." From the date of this year being immediately subsequent to that in which the king lost his reason, the story goes that C. were invented to divert his royal melancholy; but they were certainly of earlier use in France. The French clergy took greatly to C. about this time; we are afraid, too, it was to the ungenteel game of all-fours, since we find them specially forbidden that amusement by the synod of Langres, in 1404.

Card-making became a regular trade in Germany 14 years after this, and it, as well as card-painting, seems to have been carried on for some time exclusively by females; the wood-engraving of C., however, did not begin until some time afterwards. The pips were then very prettily imagined, the suits consisting of hearts, bells, acorns, and leaves. The place of her majesty the queen was filled by a knight in those days; and it is to Italy, and not to Germany or France, that the glory of giving *place aux dames* must be conceded. There was also no ace whatever! By 1420, gambling by means of C. had grown to such a pitch as to provoke St. Bernardin to preach against it at Bologna; and that so eloquently as to cause his hearers to make a fire in the public place and throw all the C. in their possession into it—a proceeding which must have been hailed with joy by the Messrs. De la Rue of that period. The signs upon Italian C., which seem to have been the first imported into England, were cups, swords, money, and clubs; but in the third year of Edward IV., their further importation was forbidden, and the home-trade of card-making protected. C. were played by that time, we read, "in all places of worship" in this country, by which it was meant, not in the churches, but in the houses of all the gentry. Henry VII. was a card-player; and there are not a few entries in that mean monarch's privy-purse account of his majesty's little losings. His daughter Margaret, at the age of 14, was found by James IV. of Scotland—the first time he ever saw her—in the act of playing cards; and it was most probably *écarté*, for he at once "proposed" to her, and she "accepted" him. There was a sum regularly allotted to the princess, afterwards queen, Mary, as pocket-money for this especial purpose; the sums given her at a time for immediate disbursement ranging from 20*s*. to 40*s*., but one entry being so disgracefully low (for a princess) as "two and tuppence." James I. likewise played a good deal, but so sleepily that he required somebody to hold his C. for him.

About the year 1660, heraldic C. were first introduced into England, the king of clubs being represented by the arms of the pope; of spades, by those of the king of France; of diamonds, by those of the king of Spain; and of hearts, by those of the king of England. From these heraldic C., we suppose, Mr. Chatto derives the word coat-card, instead of court-card, which is certainly in more general use. In 1679, a pack was published containing the history of all the popish plots, "excellently engraved on copper-plates, with very large descriptions under each card. Aspersers of this pack," it is added by their disinterested publisher, "plainly show themselves to be popishly affected."

The French, from whom we derive our ordinary suits of diamond, heart, spade, and club—*carreau*, *cœur*, *pique*, and *trèfle*—were continually changing their court-cards, and representing on them all sorts of historical characters. In the earlier periods, their kings were David, Alexander, Cæsar, and Charlemagne, or Solomon, Augustus, Clovis, and Constantine; about all of whom, as well as their queens, Père Daniel has the most ingenious theories. Troops, says he, however brave and numerous, require to have prudent and experienced generals. The *trèfle* or clover-plant, which abounds in the meadows of France, denotes that a chief ought always to encamp his army in a place where he may obtain forage for his cavalry; *piques* and *carreaux* signify magazines of arms, which ought ever to be well stored—the *carreau* being a sort of heavy arrow shot from a cross-bow, and which was so called from its head being squared (*carré*); *cœurs*, hearts, signified courage of both commanders and soldiers; the *ace* was the Latin *as*, and represented money, the sinews of war; and so on.

At the time of the French revolution, the places of the card-kings were filled by four philosophers—Molière, Lafontaine, Voltaire, and Rousseau; and those of the queens by four virtues—prudence, justice, temperance, and fortitude.

Many attempts have been made to put down card-playing by the strong hand of the law; but the history of the four kings has, nevertheless, always retained its students. Not a few enthusiastic players have absolutely died in harness, with cards in their hands, such as the great Bath player Lookup, who expired at his favorite "double dumby," not even being permitted by inexorable death to play out the game. The four kings, like their flesh-and-blood originals, are likely to lose all sway over the new world; for Mr. Chatto informs us, that the court-cards, if they can be called so, of a republican

pack manufactured in 1848 at New York, have neither kings nor queens; the president of hearts being Washington; of diamonds, John Adams; of clubs, Franklin; and of spades, Lafayette. One of the queens is Venus, modestly concealing her charms; and the others are respectively Fortune, Ceres, and Minerva; while the knaves are fitly represented by Indian chiefs.

The manufacture of playing-cards comprises many interesting processes. The cardboard employed for this purpose is formed of several thicknesses of paper pasted together; there are usually four such thicknesses; and the paper is so selected as to take paste, paint, and polish equally well. The sheets of paper are pasted with a brush, and are united by successive processes of cold-drying, hot-drying, and hydraulic pressure. Each sheet is large enough for 40 cards. The outer surfaces of the outer sheets are prepared with a kind of flinty coating, which gives sharpness to the outline of the various colored devices. Most packs of cards are now made with colored backs. The ground-tint is laid on with a brush, and consists of distemper color, or pigments mixed with warm melted size. The device impressed on this ground-tint is often very beautiful. Messrs. De la Rue, the leading firm in the manufacture, employ tasteful artists, and invest a large amount of capital, in the introduction of new patterns. On cards sold at moderate prices, the colors at the back are generally two—one for the ground, and one for the device; but some of the choicer specimens display several colors; and many of the designs are due to the pencil of Mr. Owen Jones. The printing of the design is done on the sheets of paper, before the pasting to form cardboard. The pips or spots on the faces of playing-cards are now *spades*, *clubs*, *hearts*, and *diamonds;* but at different times, and in different countries, there have been leaves, acorns, bells, cups, swords, fruit, heads, parasols, and other objects similarly represented. In English cards, the colors are red and black; Messrs. De la Rue once introduced red, black, green, and blue for the four suits; but the novelty was not encouraged by card-players. The same makers have also endeavored to supersede the clumsy devices of kings, queens, and knaves, by something more artistic; but this, too, failed commercially; for the old patterns, like the old willow-pattern dinner-plates, are still preferred—simply because the users have become accustomed to them. Until within the last few years, the printing of cards was generally done by *stenciling*, the color being applied through perforated devices in a stencil-plate. The color employed for this purpose is mixed up with a kind of paste. When there is a device at the back, the outline of the device is printed from an engraved wood-block, and the rest filled in by stenciling. The stenciling of the front and back can be done either before or after the pasting of the sheets into cardboard. One great improvement in the manufacture, has been the substitution of oil color for paste or size color; and another, the substitution of printing for stenciling. Messrs. De la Rue have expended large sums of money on these novelties; for many experiments had to be made, to determine how best to employ oil color so that the spots or pips may be equal-tinted, the outline clear and sharp, the pigment well adherent to the surface, and the drying such as to admit of polishing without stickiness. The plates for printing are engraved on copper or brass, or are produced by electrotype, or are built up with small pieces of metal or interlaced wire. The printing is done in the usual way of color-printing, with as many plates as there are colors (usually five), and one for the outlines; it is executed on the sheets of paper, before being pasted into cardboard. When the printing, drying, and pasting are all completed, a careful polishing is effected by means of brush-wheels, pasteboard wheels, heated plates, and heated rollers, in such a way that the polish on the back may differ from that on the face—since it is found that two equally polished surfaces do not slide quite so readily over each other. Every pack of cards made in England for home-use pays a duty of threepence, which duty is levied on the ace of spades. The makers of cards pay £1 per annum for a license, and formerly the venders had to pay 2*s.* 6*d.* per annum, but this latter tax was repealed on the 5th July, 1870. The carboard, when all the printing is finished, is cut up into cards; every card is minutely examined, and placed among the "moguls," "harrys," or "highlanders," as they are technically called, according to the degree in which they may be faultless or slightly specked; and the cards are finally made up into packs. Persons wishing the best cards should ask for "moguls," the usual retail price for a pack of which is 2/3 to 3/9.

A few years ago, it was estimated that about half a million packs of cards are made annually in England, by about seven or eight firms. Card-playing is not now so general in England as it was early in the century, and the number made has consequently lessened, although the quality has greatly improved. All the cards used in Russia, with a few exceptions, are made at an imperial manufactory in St. Petersburg, where the operations are conducted on a large scale, and where the number of packs made exceeds manifold the whole produce of England. The French cards are somewhat smaller and thinner than those of England.

CARDUC'CI, Bartolommeo, 1560–1610; an Italian artist; b. in Florence; studied under Zucchero, whom he accompanied to Madrid, where he painted the ceiling of the Escorial library. He died in Spain, where most of his works are to be found, the most celebrated being a "Descent from the Cross," in a church in Madrid. His brother, Vincenzo, was also a painter of celebrity, and the author of a dialogue on the excellencies of painting.

CARDU'CHI, a warlike people once inhabiting the mountains of Kurdistan, supposed to have been the ancestors of the Kurds of the present day. The Greeks, in the famous retreat of the 10,000, had to pass through their country, and were greatly harassed by them.

CARDUE'LIS. See GOLDFINCH.

CARDUUS. See THISTLE.

CARDWELL, a co. in central Ontario, Canada, formed recently from Peel and Simcoe cos.; pop. '81, 16,770.

CARDWELL, EDWARD, 1787–1861; an English clergyman and ecclesiastical historian, educated at Oxford. In 1826, he was chosen Camden professor of ancient history, and during his period of office he wrote a translation of the *Ethics* of Aristotle, with notes, and *The Coinage of the Ancient Greeks and Romans.* In 1831, he was made principal of St. Alban's hall, and held the place through life. Among his publications were a student's edition of the Greek Testament; Josephus's history with notes; *Documentary Annals of the Reformed Church of England from* 1546 *to* 1716; *History of Conferences, etc., connected with the Revision of the Book of Common Prayer; Synodalia, a Collection of Religious Canons, and Proceedings of Convocation from* 1547 *to* 1717; and *Reformatio Legum Ecclesiasticarum.*

CARDWELL, EDWARD, Viscount, b. 1813; nephew of the Rev. Edward; graduated at Baliol college, and admitted to the bar, but preferred political life and entered parliament in 1842, being several times thereafter re-chosen. In 1845, he was secretary of the treasury and president of the board of trade. He was subsequently chief secretary for Ireland, chancellor of the duchy of Lancaster, and secretary of state for the colonies. In Gladstone's cabinet, 1868, he became secretary for war and a member of the committee of the council on education. In the war office he proposed and effected a reorganization of the army. With earl Stanhope he was one of the literary executors of sir Robert Peel, and one of the editors of Peel's *Memoirs.*

CARE or CARLE SUNDAY, the Sunday before Palm Sunday, said to be so called because it was the practice in many parts of the country to eat gray peas, called carlings, fried in butter, pepper, and salt, on this day. This practice apparently had its more immediate origin in the custom of the Roman Catholic Church of eating hallowed beans fried at this time—these beans being described in some religious books as symbolical of confession, and their steeping before use, of meditation. It appears, however, to have been adopted by this church from a heathen custom. See Brand's *Popular Antiquities.*

CAREEN'ING is the operation of heaving down a ship on one side, in order to expose the other side for cleaning by the process of *breaming* (q.v.). C. is seldom now performed upon English ships, partly because the use of copper-sheathing lessens the fouling of the bottom, and partly because caissons and hydraulic lifts afford means for raising ships out of the water. The *Great Eastern*, in 1860, was placed upon an open scaffolding or frame, called a *gridiron*, in Milford Haven, and floated so as to render cleansing possible without the dangerous and difficult process of careening.

In sea-phrase, a vessel is said to "careen" when she leans over very much through press of sail.

CA'RET (from the Latin *careo*, I am wanting), a character of this form, ∧, denoting that something has been omitted, and is interlined.

CAREW, GEORGE, 1557–1629; Earl of Totness and Baron of Clopton; educated at Oxford and joined the army, holding an important command in the Irish wars against the earl of Desmond. He filled several offices, among them that of one of the lord judges of Ireland, in which by a vigorous but prudent policy he speedily reduced the rebels to submission. His crowning exploit was the capture of Dunboy castle, an event that greatly disappointed the Spanish allies of the Irish, and ended the war. For these services he was raised to the peerage and made governor of Guernsey. His last office was that of privy councilor to James I. He wrote *Hibernia Pacata*, a history of the wars in Ireland.

CAREW, Sir GEORGE, d. about 1613; educated at Oxford, and knighted by queen Elizabeth. He was secretary to sir Christopher Hatton, and was sent as ambassador to the king of Poland. Under James I. he was employed in negotiating the treaty of union between England and Scotland, and afterwards as ambassador to France. He was the author of a *Relation of the State of France.*

CAREW, RICHARD, 1555–1620; an Oxford student who at the age of 14 was chosen to dispute extemporaneously with sir Philip Sidney in the presence of an audience of noblemen. He was sheriff of Cornwall, and the author of a *Survey* of that county, a work that enjoyed a high reputation. He also wrote, or translated from the Italian, *The Examination of Men's Wits; The True and Ready Way to Learn the Latin Tongue;* and made a translation of the first five cantos of Tasso's *Jerusalem Delivered.*

CAREW, THOMAS, a poet of the reign of Charles I., descended from an old family in Gloucestershire, was b. 1589. Having been educated at Oxford, he traveled abroad for some time, and on his return was received at court, and patronized by Charles I. C. deserves mention chiefly as the precursor and representative of what may be called the

courtier and conventional school of poetry, whose chief characteristic was scholarly ease and elegance, with a spice of indelicacy, and even indecency. C.'s poems, mostly lyrical, and treating of trifling subjects, are among the best of their kind, and exhibit much fancy and tenderness. He died 1639. Several editions of his poems, which first appeared in 1640, have been published.

CA'REX, a genus of plants of the natural order *cyperaceæ*, of which the species are very numerous—more than 450—principally abounding in the temperate and colder parts of the world. More that 60 are natives of Britain. The English name SEDGE or SEG is sometimes employed as synonymous with C., but is popularly applied only to some of the species. This genus is distinguished by unisexual flowers, the male flowers with one glume, the female inclosed in a flask-shaped involucre. Some of the species are plants of the very humblest growth, others are 2 or 3 ft. in height; all are of unpretending, grassy, or rush-like appearance. Some grow in wet, and others in dry situations; some are of great value in the economy of nature, as forming the principal part of the vegetation of swamps, which they gradually convert into fertile ground. The running roots, or rather *rhizomes*, of some help to bind the sands of sea-shores, particularly *C. arenaria*, which is carefully planted for this purpose on the dikes of Holland. None are valued by the agriculturist, as they are very deficient in nutritive quality, and in general they abound only in very inferior pastures, and good tillage and drainage lead to their speedy disappearance. The rhizomes of *C. arenaria*, *C. hirta*, and *C. disticha*, are sometimes used under the name of *German sarsaparilla*, as a diaphoretic and demulcent medicine—a bad substitute for sarsaparilla. The two former are common in Britain. The dried leaves of *C. sylvatica* are used by the Laplanders to cover their legs and hands as a protection from frost-biting and chilblains, being worn in the inside of their shoes and gloves.

CAREY, HENRY, d. 1743; an English musical composer and poet, an illegitimate son of George Saville, marquis of Halifax. Carey's ballads and songs, though of no great merit as compositions, were very popular at the time. He wrote a number of dramatic pieces, among which were *Chrononhotonthologos*, a burlesque on tragedy; the *Honest Yorkshireman*, an operetta; *Nancy and Thomas and Sally*, interludes; *The Dragon of Wantley, Margery or the Dragoness*, burlesque operas. One of his songs, *Sally in our Alley*, is still remarkably popular in England.

CAREY, HENRY C., a political economist of the United States, b. at Philadelphia in 1793. In 1836, he published an essay on the *Rate of Wages*, which was expanded into the *Principles of Political Economy* (1837–40). The value of this work may be estimated from the fact, that no less an authority than Frederic Bastiat copied its leading ideas. It was translated into Italian and Swedish, and favorably noticed in all the important politico-economic journals of Europe. In 1838, C. published *The Credit System of France, Great Britain, and the United States;* and in 1848, *The Past, the Present, and the Future*, a work marked by great vigor and originality. In 1853, appeared the *Letters on the International Copyright;* in 1858, *Principles of Social Science;* in 1867, *Review of the Decade* 1857–67; and, in 1873, *The Unity of Law.* C. was originally a free trader, but was ere long recognized as the head of a new school of political economy. According to this system, free-trade may be the ideal towards which we should tend, but a period of protection is an indispensable stage in the progress towards it. He d. 1879.

CAREY, MATHEW, b. Ireland, 1760, d. Philadelphia, 1839; an author and publisher. In consequence of publishing an address to the Irish Roman Catholics on their oppression by the penal code (about 1778) he was compelled to leave Ireland, but returned within a year and established, in 1783, the *Volunteer's Journal*. His attacks upon parliament and the ministry caused his imprisonment in Newgate until the dissolution of parliament. He arrived in Philadelphia by the aid of Lafayette, who sent him $400, and immediately started *The Pennsylvania Herald*, one of the first papers in the country to furnish accurate reports of legislative debates. In Jan., 1786, he fought a duel with col. Oswald, another editor, and was seriously wounded. He was subsequently connected with the *Columbian Magazine* and the *American Museum*. In 1791, he began trade as a bookseller, and with his sons built up a prosperous business. During the epidemic of yellow fever in 1793 he was active in the work of relief, and afterwards wrote a history of the disease. In 1793, he, with others, founded the Hibernian society, and in 1796 he assisted bishop White in establishing the first Sunday-school society. Carey was a constant writer, and published a great number of essays on party politics, political economy, and social questions. Among his favorite ideas were internal improvements and a protective tariff. His son Henry C. (see *ante*) was one of the foremost American writers on political economy.

CAREY, WILLIAM, D.D., a distinguished minister and missionary belonging to the Baptist body, was b. at Paulersbury, a village in Northamptonshire, Aug., 1761. He served his time as a shoemaker, but began to preach about his 20th year. A pamphlet which he published about this time, attracted the attention of his co-workers in the ministry to the subject of foreign missions, and ultimately a missionary society, chiefly through C.'s exertions, was formed. C. and a Mr. Thomas were chosen its first missionaries to India in 1793. From that time until his death in 1836, C. was indefatigable

(under many difficulties, especially in his early years) in his efforts to spread the knowledge of the Gospel among the heathen. Under his direction, the Serampore mission, of which he was the principal founder, had up to 1832 issued above 200,000 Bibles, or portions thereof, in about forty oriental languages or dialects, besides a great number of tracts and other religious works in various languages. A great proportion of the actual literary labor involved in these undertakings was performed by C. himself, whose Sanskrit and other grammars have been very highly spoken of by the late Mr. Wilson Boden, professor of Sanskrit at Oxford. C. was professor of oriental languages at Fort-William college, Calcutta, from 1800 to 1830.

CARGILL, DONALD, 1610–81; a leader of the covenanters appointed to a church in Glasgow, where he made himself so obnoxious to the government that he was forced to leave. He was wounded in the battle of Bothwell, and fled to Holland; but returned almost immediately and joined Richard Cameron in publishing the Sanquhar declaration, and boldly excommunicated the king and his officials. He was soon afterwards arrested and beheaded at Edinburgh, July 27, 1681.

CARGO is a general name for all the merchandise carried on board a trading-ship. Sometimes it is applied also to the invoice of the cargo. The term *deck-cargo*, is given to the commodities on deck, which are not usually included in the policy of insurance.

For the security of the customs' revenue, the master of every coasting-vessel is bound to keep a *cargo-book*, recording the name of the vessel, the name of the owner, the port of departure, the port of destination, the goods taken, the name of the shippers and consignees, the time of departure and other particulars. The custom-house officers may demand to see this book at any time. The C. of passenger ships is placed, in some degree, under the control of the emigration officers by an act passed in 1852.

CARHEIL, ETIENNE DE, a Jesuit missionary among the Indians of Canada about 1668. He was among the earliest to master the native languages. The time of his death is not known, but he was at missionary work as late as 1721.

CA'RIA, in ancient geography, the south-westernmost country of Asia Minor, bounded n. by Lydia, e. by Phrygia, s.e. by Lycia, and w. and s.w. by the Mediterranean. A large portion of what was C. is mountainous. The chief ranges were called the Cadmian and the Latmian. The most important river was the *Mæander*, famous for its windings. C. was, at an early date, governed by petty princes or kings; it afterwards became a part of the Persian empire, the former princes continuing to rule as satraps; and it subsequently came into the hands of the early Macedonian kings of Egypt; and finally, with the rest of Asia, into those of the Romans. Among the chief towns were Cnidus, Halicarnassus, and Miletus.

CARIA'CO, a seaport of Venezuela, at the mouth of a river, and at the head of a gulf of the same name. It is 40 m. to the e. of Cumana, in lat. 10° 30′ n., and long. 63° 40′ west. Pop. 7,000. The gulf, long and narrow, with good anchorage, and well-wooded shores, is open only on the w., and that to a portion of the Caribbean sea, which is itself breasted by a chain of islands.

CA'RIACOU, CARJACOU, or VIRGINIAN DEER, *Cervus Virginianus*, a species of deer found in all parts of North America, from Mexico to about n. lat. 43°, and from the Atlantic to the Pacific ocean. It is the species commonly called deer by the Anglo-Americans. It is smaller and more elegant than the common stag; of very variable color—light reddish brown in spring, slaty blue in autumn, and dull brown in winter; the belly, throat, chin, and inner parts of the limbs white. The horns of the adult male are of moderate size, bent strongly backward, and then suddenly forward, so as to bring their tips nearly above the nose; they have several snags. The fawn is profusely decked with white spots, arranged in lines, and sometimes running into stripes. The name C. is extended generically to several nearly allied species, found in Mexico, California, etc.

ÇARIA'MA, *Microdactylus cristatus*, a bird of the order *grallæ*, allied to the cranes, but exhibiting also points of strong resemblance to gallinaceous birds, among which it has therefore been proposed to rank it, next to the guans. It is a native of Guiana, Brazil, and Paraguay, inhabiting open plains and the outskirts of forests, where it feeds chiefly on serpents, lizards, and insects. It is larger than the common heron; the plumage is brown, finely waved with darker brown, whitish on the lower parts. When pursued, the Ç. seeks safety by running, and does not readily attempt to use its wings. Its voice resembles that of a young turkey. It is much esteemed for the table, and it is sometimes reared in a domesticated state.

CARIBBE'AN SEA, the grandest inlet of the western hemisphere—corresponding, in several respects, to the Mediterranean in the eastern—is separated from the gulf of Mexico by Yucatan, and from the Atlantic ocean by the great arch of the Antilles, between Cuba and Trinidad inclusive, stretching in n. lat. from about 8° to about 22°, and in w. long. from about 61° to about 89°. The C. S. forms the turning-point in the vast cycle of waters known as the Gulf stream (q.v.), that wheels round, with the regularity of time itself, from southern Africa to northern Europe. Its pours its waters into the gulf of Mexico on the w., which shoots forth, on the e., the Florida stream with the computed volume of 3,000 Mississippis. To supply this enormous efflux, the C. S. draws on the Atlantic, laying under contribution nearly all the trade-wind regions of that ocean,

so as literally to become the reeeptacle of the Amazon and the Orinoeo. To the British isles, it is, in this connection, an object of peculiar interest. Rendering still warmer the warm floods which it eoncentrates, it imparts to the Florida stream that high temperature which tends, with the aid of the prevalent winds, to mitigate climate from Guernsey to Shetland. In common with the islands of its eastern boundary, the C. S. takes its name from their now extinct aborigines, the Caribs.

CARIBBEE BARK, or PITON BARK, is the bark of *exostemma Caribœum*, a small tree which grows in the West Indies and in Mexico, and belongs to the natural order *cinchonaceæ*. The genus *exostemma* is very nearly allied to *cinchona*, from which it differs in having the stamens exserted, whereas in *cinchona* they are included within the corolla. *E. Caribœum* has ovate lanceolate leaves, and is known in the West Indies as the *sea-side beech*. C. B. has a very bitter taste, and a very faint smell. It contains none of the characteristic alkaloids of cinchona, yet very much resembles it in some of its properties, and is one of the barks sometimes substituted for the true cinchona barks.

CARIBBEE ISLANDS. See ANTILLES, *ante*.

CARIBOU'. See REINDEER, *ante*.

CA'RIBS, Indians of the West India islands, who were in the time of Columbus numerous and powerful; a warlike and aggressive people, who pertinaciously opposed the advances of the Europeans. It is supposed, though not proved, that they were addicted to cannibalism. They have almost entirely disappeared from the islands; and at present their chief settlement is in Honduras, where they form an industrious and prosperous portion of the people, though still retaining their language and many of their customs. In 1796, the English, weary of the continual disturbances occasioned by the Caribs, transported them in a body from Dominica and St. Vincent to the island of Ruatan. There are two great tribes, the red, and the black; the former were descendants of the ancient stock, and the latter mixed with negro blood. Some of the Indians in South Ameriea are apparently of the same raee.

CARICA. See PAPAW.

CARICATURE (Ital. *caricatura*, from *caricare*, to load or overeharge). The etymology of this word indicates its meaning very distinctly, which is that of a representation of a faee, form, or character, in which the salient features are exaggerated or overloaded, to the extent of producing a ludicrous effect, without entirely, or even essentially destroying the resemblance. C. may be regarded as the opposite of idealization; the former consisting in a disproportionate development of some, very frequently of one only, of the characteristics of the subject treated, the latter in a proportionate elevation of them all. Nay, further, the destruction of harmony is essential to C., and where harmony is the prevailing quality of its subjeet, the required effect may frequently be produced by this means alone; whereas harmony belongs of necessity to idealization, and where its absence was the characteristic defeet of the object as a real existenee, an ideal of a humble kind may frequently be produced by simply restoring it.

When used with reference to sensible representation, C. stands, to the genuine productions of the plastic and pictorial arts, in the same relation in which farce stands to the legitimate drama. Both C. and farce are thus degenerate forms of art; and though requiring much cleverness for their successful execution, and often affording lively satisfaetion to the spectator, can scarcely be said in general to have an elevating object, or any other tendency than to amuse. When used as ancillary to well-directed and meritcd satire, C. assumes a noble character, and it is to the credit of our nation that it is so frequently thus employed in our ephemeral literature. The best examples of C. which have ever appeared in the literature of any people, are to be found in the pages of *Punch*.

CA'RIES (*rottenness*) is a disease of bone analogous to the ulceration of soft tissues. It is characterizcd by a gradual loss of substance, from the particles of bone being absorbed, or being cast off and washed away in a purulent discharge. It begins as an unhealthy inflammation, followed by exudation of new materials, and softening of the part affected. On examination, the bone-eells are found filled with a reddish glairy fluid, and in scrofulous patients, deposits of tubercle. After C. has existed for some time, an abseess forms, and bursts; its aperture remains open, discharging a thin fluid, which contains particles of the bone. If a probe be passed through this opening, it will be felt to sink into some soft gritty substanee; this is the earious bone, which, if removed, and well washed, will be found to resemble in whiteness and fragility loaf-sugar softening in hot water.

C. may attack any bone, but it usually seleets the vertebræ, those of the wrist and foot, and the soft ends of long bones forming joints. To this terrible disease most deformities, not eongenital, are owing. The carious vertebræ yield under the weight of the trunk, and the spine eurves forwards, or to one side. In the joint-ends of bones, the part enlarges, the cartilages beeome affeeted, matter forms, and amputation of the limb, or excision of the joint, is frequently neeessary to save the patient's life. Too often the disease reeurs with night-sweats, heetic, and death.

The eauses of C. are constitutional, though it may be aeeidentally determined to some

particular part of the body by any irritation, such as a blow, or exposure to atmospheric changes. Scrofulous persons, and those who have had syphilis or mercury in excess at any period of their lives, are more subject to it than others. If affecting a small bone, the latter may be entirely removed; and if the disease is strictly limited to the ends of bones forming a joint, these may be excised. Within the last 30 years, great advances have been made in this department of surgery, and C. of the joints is but seldom counted a sufficient reason for amputation; the knee, hip, shoulder, elbow, ankle, and wrist joints have all been repeatedly excised successfully in this country. In situations where the part cannot be reached by instruments, lotions of dilute acid may be injected, with the view of stimulating the carious surface to assume a healing action.

The treatment of C. consists in supporting the patient's strength by judicious change of air, and tonics, with the administration of medicines, such as cod-liver oil in scrofula, which appear to combat the constitutional predisposition to the disease. In those parts where the diseased bone can be reached, it should be gouged or scraped away, so as to leave a healthy surface of bone, which may granulate up, and heal.

CARIES OF THE TEETH depends, it is supposed, on an original faulty formation of their substance, when, after any depressing cause, especially in scrofulous and ill-nourished persons, they soften and crumble away, at last laying open the cavity which contains the nervous pulp of the tooth, and producing toothache. *Treatment.*—The carious surface should be removed, and, as a substitute for the lost substance, gold or some other substance should be stuffed into the cavity. If the pulp be exposed, the hole should be stuffed with some softer material, till the parts are somewhat hardened; for this, Mr. Tomes of London recommends a plug of cotton-wool dipped in a mixture of mastich, a dram, and rectified spirit or eau-de-Cologne, 1½ oz.; or of gutta-percha dissolved in chloroform.

CARIGNA'NO, a t. of Piedmont, in the province of Turin, about 11 m. s. of the city of that name. It is situated near the left bank of the Po, in the midst of a most beautiful country; has some fine churches, manufactures of silk-twist, and a pop. of 7,712. This town gives name to a branch of the house of Savoy.

CAR'ILLON. See BELL.

CARIMA'TA, a name applied to the passage between Borneo and Billiton; also to a cluster of islets in the same passage; and lastly, to the principal member of the group, whose highest point, a peak of 2,000 ft., is in lat 1° 36′ s., and long. 108° 54′ e.

CARINA'RIA, a remarkable and interesting genus of gasteropodous mollusks, of the order called *heteropoda* or *nucleobranchiata*, having a thin shell, in form somewhat like that of a limpet, which, however, only covers the visceral sac (heart, gills, etc.), leaving the greater part of the animal exposed. The shells of some of the species have been sometimes denominated *Venus's slipper* and *glass nautilus*. The body is gelatinous, and so transparent that much of its interior organization can be seen. Nearly opposite to the part of the back occupied by the shell is a sort of vertical fin, answering to the foot of the other gasteropods. The species of C. are all marine, are found only in the seas of the warmer latitudes, and generally swim with the back downward. Closely allied to C. is the genus *firola*, in which there is no shell at all.

CARI'NI, a t. of Sicily, in the province of Palermo, and 12 m. w.n.w. of the city of that name. It has an old castle; and a pop. of 9,600, chiefly engaged in fishing.

CARINO'LA, a t. of s. Italy, in the province of Caserta, 20 m. s.e. of Gaeta. It has a cathedral, and a Franciscan convent. The district produces excellent wine. Pop. 6,620.

CARIN'THIA (Ger. *Kärnthen*), a crown-land of the Austrian empire, forming part of the old kingdom of Illyria, with an area of 3,958 sq.m., and a pop. in 1880, of 348,730. which is rather less than what it was in 1854. The principal river is the Drave, which passes through the country from w. to e., in a course of almost 150 miles. The general aspect of the country is mountainous, with long deep valleys, that of the Drave widening at Villach and Klagenfurt into a great plain. The valley of the Drave divides the *Noric* from the *Carinthian Alps*. Agriculture is carried on to a limited extent, owing to the mountainous character of the country, great part of which is occupied in pasture, or covered with brushwood. Many horses and cattle are reared and exported. The principal products are mineral. One of the principal branches of industry is the manufacture of hardware; the other manufactures include woolens, silk stuffs, and cottons. The capital is Klagenfurt.—The ancient inhabitants were the *Carni*, who derived their name from the Celtic word *carn* or *corn*, Lat. *cornu*, Eng. *horn*—an allusion to the craggy, horn-like pinnacles of their hills. Before the time of Augustus, it belonged to Noricum, afterwards to the Roman empire. By and by the Carni were swept away in the deluge of immigation from the e., and Slaves settled in the country. After some time the Slaves themselves were so heavily oppressed by the Avari, that they called to their assistance a Frank, named Samo, who founded the kingdom of Carantania, which included much more than the present C., but fell to pieces after his death. Finally, it came into the possession of Austria (q.v.). Only about two sevenths of the present population is Slavic (Slovenians), the remainder being Germans.

CARI'NUS, MARCUS AURELIUS, son of Carus, succeeded his father as emperor of Rome in 283 A.D. He was a cruel and profligate ruler, and the soldiers naturally

rebelled, proclaiming Diocletian. Carinus marched into Mœsia to quell the revolt, and won a decisive victory, but at the moment of triumph he was killed by one of his soldiers whose wife the profligate emperor had led away.

CARI'PE, a t. of Venezuela, South America, situated in a fertile valley of the same name, 50 m. s.e. of Cumana. The valley is noted for a cavern frequented by the remarkable bird called guacharo (q.v.). Pop. of town and valley, 5000.

CAR'ISBROOKE, a village in the isle of Wight almost adjoining Newport, chiefly noted for its castle, which is supposed to have been built by the Saxons in the 6th century. It was enlarged in the 11th c. by the first lord of Wight; was captured by Stephen in 1136, and in the time of Richard II. successfully resisted attacks by the French. During Elizabeth's reign it was further enlarged until its outer walls inclosed 20 acres. It was in this castle that Charles I. took refuge in Nov., 1647, but he soon found his asylum a prison. After his execution his two youngest children were confined in the castle, and the princess Elizabeth died there. The remains of the castle are still extensive. Opposite the castle-hill are the remains of a Cistercian priory founded in the 11th c., and the parish church claims even a greater antiquity. Pop. of parish '71, 8198.

CARIS'SA, a genus of plants of the natural order *apocynaceæ*. *C. carandas* is a thorny shrub, much used for fences in India; and the fruit, called carandas—a berry about the size of a small plum—for tarts and preserves.

CARIS'SIMI, Giovanni Giacomo, b. about 1604 near Rome; became chapel-master, or director of music, at the age of 20. By education he belonged to the old Roman school of music, but his compositions mark the turning-point from the traditions of the renaissance period to the incipient aspirations of modern music. His numerous compositions include masses, cantatas, motets, and oratorios.

CAR'LEE, or Karli, a village in India, 40 m. e. of Bombay, remarkable only for a Buddhist temple hewn into a rocky precipice which rises 800 ft. above the plain, the temple being about two thirds of the way up. The temple is 130 by 40 ft., with a high arched roof. An arch rises over the entrance to the artificial cavern, and before each of the side entrances are screens of stone-work ornamented with naked male and female figures in *alto-rilievo*. In front are three large lions, and around the portico are figures of elephants, each one surmounted by a driver and a howdah or saddle containing figures of two persons. The interior is finished with a double row of sculptured pillars forming a semicircle. This curious temple is well preserved.

CARLEN, Emilie, a well-known Swedish novel-writer, was b. 8th Aug., 1807, at Strömstad, near the frontier of Norway. She was the youngest of 14 children of a merchant named Smith. During childhood her talent in imaginative fiction was remarked by her friends; but it was not till 1838 that her first novel, *Waldemar Klein*, was given to the world. She was then a widow, having been married, in 1827, to Dr. Flygare. In 1841, she was again married to J. G. Carlen, a lawyer, and known as a poet, in Stockholm. Her literary productiveness has been very remarkable, her fictions being chiefly founded on the characteristics of the lower orders in Sweden; and, although faulty in many respects, they are especially rich and striking in incident; and her characters, without exhibiting any very deep insight or subtle analytic power, are yet intelligent and consistent. Among her many works, which have been translated into English, are *The Rose of Thistleland; The Birthright; The Hermit; The Events of a Year; The Lover's Stratagem; Gustavus Lindurm; The Maiden's Tower; Woman's Life*, etc. Her works are largely circulated both in Europe and in America.

CARLETON, a co. in New Brunswick, Can., on the Maine border, drained by the St. John and its tributaries; 3,008 sq.m.; pop. '81, 23,365. The surface is rough, with forests and excellent timber. Chief town, Woodstock.

CARLETON, a co. in e. Ontario, Can., on the Ottawa river; 647 sq.m.; pop. '81, 24,689. The co. is traversed by the Ottawa and Prescott railroad, and the Rideau canal. Lumbering is the principal business of the people. Chief town, Ottawa City.

CARLETON, Sir Guy, Lord Dorchester, 1724–1808; a British officer distinguished at Louisburg, Quebec, and Belle Isle, and wounded in the siege of Havana in 1762. He was a lieut.gen. in the British army, and the successor of sir Henry Clinton in chief command in the American colonies during the war of the revolution and till its close.

CARLETON, William, one of the most popular writers of tales describing Irish life and manners, was b. 1798, at Prillisk, in the co. of Tyrone, Ireland. Bred and educated among the peasantry, he passed through the common sufferings and privations of Irish poverty, and, after receiving some scanty instruction in a hedge-school, he, in his 17th year, went to an academy which a relative had opened at Glasslough, where he remained two years. Afterwards, a vague ambition led him to Dublin, where he arrived with only some three shillings in his pocket, and where, in 1830, he published his *Traits and Stories of the Irish Peasantry*. Their freshness of style pleased the public, and won the favor of critics. A second series, issued in 1832, was also well received; and, in 1839, he published a powerful story, entitled *Fardorougha the Miser*, in several passages of which, however, his humor becomes extravagant. Subsequently, C. published a series of tales (3 vols., Dub. 1841), mostly of pathetic interest, but including a very genial

and humorous sketch of the *Misfortunes of Barney Branagan*, which proved a great favorite. The story of *Valentine M'Clutchy* is half-political and half-religious in its tendency, defending the Irish Catholic priesthood, and advocating repeal of the union; it appeared in 1845. Other narratives—*Rody the Rover*, 1846; *The Black Prophet*, 1847; and *The Tithe Proctor*, 1849—contain many proofs of the author's genius. *Willey Reilly*, 3 vols., appeared in 1855, and *The Evil Eye* in 1860. C. is the true historian of the Irish people. Sharing in their qualities of mind and temperament, he has a true sympathy with all their joys and sorrows, and a graphic and picturesque pen with which to describe them. In consideration of his literary services, he enjoyed a government pension of £200 a year, and on his death in Jan., 1869, the queen granted a pension of £100 to his widow.

CARLETON, Will. See page 889.

CARLI, Giovanni Rinaldo, a distinguished Italian economist and archæologist, was b. at Capo d'Istria, April, 1720. Educated at home and at Flambro in the Friuli, he was, in his 24th year, appointed professor of astronomy and navigation at Padua. In 1754, he published the first volume of his great work *On the History of the Coins and Currency, and on the Institution of the Mints of Italy*, the fourth and last volume of which appeared six years later. The book treats of the monetary history of Italy from the fall of the western empire until the 17th c., and is profusely illustrated with representations of coins, national and foreign, circulating in Italy during the various ages; and their value as compared with the price of provisions at different periods is also calculated. His merits as a financier were not overlooked. He was made president of the council of commerce and public economy at Milan, and afterwards president of the new council of finances, into which branch of administration he introduced many admirable reforms. The inhabitants were also indebted to his influence for the abolition of the inquisitional tribunal. He also wrote some valuable works on Istrian and other antiquities; dissertations on classical subjects; against sorcery; against Rousseau's theory of natural religion, etc. He died Feb., 1795. His works, exclusive of his *Italian Antiquities*, were published in 19 vols. 8vo (Milan, 1784–94).

CARLINE THISTLE, *Carlina*, a genus of plants of the natural order *compositæ*, closely allied to the true thistles, from which they are distinguished by the inner scales of the involucre spreading like rays, and being colored and shining. These involucral scales are remarkably hygrometric, expanding in dry and closing together in wet weather, and this property they retain for a long time; the heads of flowers are therefore often nailed on cottage-doors in many parts of Europe, to indicate the weather. The name C. T. is derived from a legend, that an angel showed the root of one of the species to Charlemagne, as a remedy for a plague. This species, *C. acaulis*, grows on hills and mountains, especially in calcareous soils in the middle latitudes of Europe. It has a very short stem, and very large heads of flowers, and was formerly in high repute for the medicinal virtues of its root—which is in large doses a drastic purgative—but its use is now almost confined to veterinary practice.—The only British species is the common C. T. (*C. vulgaris*), not unfrequent in England and some parts of Scotland, and sometimes rather a troublesome weed, but always indicative of a poor soil. It has a stem about a foot high; and many purplish heads of flowers set amidst straw-colored rays.

CAR'LINGS, in ship-building, are small beams laid fore and aft, and resting upon the main or deck beams. These, with other pieces called *ledges*, laid at right angles to them, form a framework by which the deck is supported.

CARLINVILLE, a t. and seat of justice in Macoupin co., Ill., on the Chicago and Alton railroad, 39 m. s.w. of Springfield. C. is the seat of Blackburn university, and is an important center for local trade. Pop. township, 1880, 4,014.

CARLISLE (*ante*), the seat of justice of Cumberland co., Penn., on the Cumberland Valley railroad, at the junction of the Pine Grove branch, 18 m. w. by s. of Harrisburg; pop. 1880, 6,209. It is in a highly productive agricultural region; is well built, with wide and handsome streets, and several fine public buildings. Dickinson college was founded here in 1783 by the Methodist denomination. Near the town are the well-known C. barracks; and in the mountains 4 m. n. is C. Springs, a famous watering-place. Washington had his head-quarters in C. during the whisky rebellion in 1794, and in July, 1863, the place was bombarded by the confederates.

CARLISLE, a parliamentary and municipal borough, episcopal city, and ancient town in North Cumberland, the capital of the co., 12 m. e. of the Solway firth, 300 m. n.w. by n. of London, 101 m. s. of Edinburgh, and 60 w.s.w. of Newcastle. It is a chief station on the w. railway route from London to Edinburgh, and is the terminus of seven different lines of railway. It stands on an eminence in a wide plain at the confluence of, and nearly surrounded by, the Eden, Caldew, and Peteril. Many fine new streets and buildings have been lately added to the city. The chief branches of industry are cotton, gingham, and check manufactures; print, iron, and dye works; and salmon-fisheries. It has a small cathedral of red freestone, of which Paley was archdeacon. The castle was founded in 1092, and is now a barracks; the remains of the keep form a massive lofty tower, with a very deep well. Mary queen of Scots was confined in the castle after the battle of Langside. A canal of 11 m., from Bowness on the Solway

firth to C., formerly admitted vessels of 100 tons; but the bed of the canal has now been converted into a railway, from which a line also branches to the newly formed port of Silloth, where an extensive dock has been constructed on the Solway, at a distance of 20 m. from Carlisle. Pop. in 1763, 4,000; 1801, 10,221; 1851, 26,310; 1861, 29,417; 1881, 35,866. C. returns two members to parliament. The total number of vessels that entered the port of C. in 1876 was 568, of 109,905 tons; cleared 695, of 123,305 tons. Roman remains have been found here—coins, altars, inscriptions, brass incense vases, etc. Being near the w. end of Hadrian's wall, C. was probably a Roman station. It was the seat of the ancient kings of Cumbria. The Picts and Scots ravaged it. About 900, it was destroyed by the Danes, after which it remained desolate for 200 years. Thence to the union of England and Scotland, it was closely connected with the border wars, and underwent many sieges. To its being long a fortified border town it owed much of its importance and privileges, but it declined much after the union. The C. corporation, in 1745, proclaimed prince Charles king of Great Britain. The duke of Cumberland afterwards took the city, and punished the chief actors with death, and the inhabitants with other cruelties. In 1133, Henry I. made C. a bishopric.—The C. tables of mortality, based on the deaths which occurred in C. 1779–87, were drawn up by Dr. Heysham, and have been ever since much used by life-insurance offices, as being nearest the average.

CARLISLE CATHEDRAL was commenced about 1092 by Walter, a Norman. It was founded by William Rufus, and dedicated in 1101 by Henry I.; and in 1133, was made the cathedral church of the newly formed diocese. A great part of the original Norman building was destroyed by fire in 1292. The new edifice contains specimens of all the styles of early English—simple pointed, geometric, and flowing. Two thirds of the fine Norman nave, originally 141 ft. long, were destroyed by Cromwell; the portion that was left has long been used as a parish church. In 1853, the restoration was commenced. The choir is one of the finest in England, 138 ft. long, and 72 high, and consists of 8 pointed arches. The e. window, consisting of 9 lights, is considered the finest decorated window in England. The tower is very low, rising but one story above the choir. It formerly supported a timber spire, which was removed in 1661. This cathedral has four canons.

CARLISLE, the capital of Cumberland co., Penn., U. S., 18 m. s. by w. of Harrisburg, the center of a rich agricultural country; seat of Dickinson college, a flourishing Methodist institution; with 13 churches, 2 banks, 2 newspapers, machine shops, rail-car factory, and U. S. barracks; was shelled by the Confederates, July 1, 1863. Pop. '70, 6,650. See a preceding article.

CARLISLE, FREDERICK HOWARD, Earl of, 1748–1825; an English statesman; one of the commission sent to the American colonies by lord North about 1778 to endeavor to effect a reconciliation, which effort was a failure, not from mismanagement but because of the unpopularity of North's administration. In 1780, C. was made viceroy of Ireland, where, in a very critical period, he managed to maintain peace and promote prosperity. In the discussion concerning the regency, C. favored the prince of Wales, and in the period of the French revolution he was a vigorous supporter of the war. After opposing the corn laws in 1815, he took no further part in public affairs.

CARLISLE, GEORGE WILLIAM FREDERICK HOWARD, Earl of, K.G., was b. April 18, 1802. Educated at Eton and Oxford, he, in 1821, obtained the Chancellor and Newdegate prizes for his Latin and English poems. He entered the public service in 1826 as an attaché. In 1830, he (then lord Morpeth), along with Henry (afterwards lord) Brougham, was elected one of the representatives of the important constituency of Yorkshire, and after the reform bill for the West Riding, a position which he held in the liberal interest for several years. Under the administration of lord Melbourne, he held the office of chief secretary for Ireland (1835–41), and his impartial distribution of patronage made him very popular in Dublin. Rejected in 1841 by the West Riding, he was again elected in 1846, and remained one of its representatives until the death of his father (1848) called him to the house of lords. Under lord John Russell's ministry (1846–52), he was chief commissioner of woods and forests, and afterwards chancellor of the duchy of Lancaster. When lord Palmerston was made prime minister in 1855, C. was appointed lord lieutenant of Ireland, a post which he held until the advent of the earl of Derby's government in 1858; and he succeeded to the same office again when lord Palmerston was reinstated in 1859. C. obtained some reputation as a literary man, chiefly by his lectures on his travels in the United States, on the life and writings of Pope, and his *Diary in Turkish and Greek Waters*. He died in 1864.

CARLISLE, JOHN G. See page 889.

CARLISTS. See CARLOS DE BOURBON (*ante*) and CARLOS, DON.

CARLOS, DON, Infante of Spain, b. July 3, 1545, at Valladolid, was a son of Philip II. After his recognition as heir to the throne, in 1560, Don C. was sent to study at the university of Alcala de Henares; where, however, he profited so little, that the king, regarding him as unqualified to reign, invited a nephew, the archduke Rudolf, to Spain, intending to make him heir to the throne. Excluded from all participation in the government, Don C. conceived a strong aversion toward the king's confidants, and especially was unwilling that the duke of Alva should have the government of Flanders.

In confession to a priest, on Christmas eve, 1567, he betrayed his purpose to assassinate a certain person; and as the king was believed to be the intended victim, this confession was divulged. The papers of Don C. were seized, and being tried, he was found guilty of conspiring against the life of the king, and of traitorously endeavoring to raise an insurrection in Flanders. The sentence was left for the king to pronounce. Philip declared that he could make no exception in favor of such an unworthy son; but sentence of death was not formally recorded. Shortly afterwards, he died, July 24, 1568, and was interred in the Dominican monastery, El-Real, at Madrid. The suspicion that he was poisoned or strangled, has no valid evidence to support it. Schiller, in his tragedy *Don Carlos*, has widely departed from historical testimonies.

CARLOS, Luis Maria Fernando, Don, 1818–61; son of Don Carlos Maria Isidor. In 1846, he lived in England with his father, under the name of Montemolin. In April, 1849, he went in disguise to Spain, was discovered and kept in prison for a few days, but returned to England before the end of the month. In 1860, he invaded Spain with 3,000 men, and was defeated and made prisoner at Tortosa. Being again set free, on condition of renouncing his claim to the throne, his first act was to repudiate that renunciation.

CARLOS, María de los Dolores Juan Isidor Josef Francesco Quirino Antonio Miguel Gabriel Rafael, Don, b. Mar. 30, 1848; nephew of Luis Maria Fernando; present claimant of the throne of Spain as the legitimate heir of Charles VIII. As Charles VI. died without issue, his rights devolved upon his brother Don Juan, who had married the archduchess Maria Theresa of Austria, princess of Modena. Their son, the present Don Carlos, was educated principally in Austria, and married Margaret de Bourbon, princess of Parma, daughter of the late duke Ferdinand, Charles III., and sister of the present count de Chambord, who claims to be Henry V. of France. In Oct., 1868, Don Juan abdicated in favor of his son, whose standard was raised by some of his partisans in the n. of Spain in April, 1872. On the 16th of July following, Don Carlos published a proclamation calling upon the people of Catalonia, Aragon, and Valencia to take arms in his cause, promising to restore their ancient liberties; and in Dec. his brother, Don Alfonso, assumed command of the Carlist forces in Catalonia. Don Carlos himself made his entry to Spain, July 15, 1873, announcing that he came for the purpose of saving the country. Thenceforward there was incessant war in the n. part of the kingdom or the republic, in which there were victories on both sides; but for the most part the battles were unfavorable to the Carlists, until Feb., 1876, when their cause was completely crushed at Tolosa, the defenders of that last stronghold flying in a panic toward France. Don Carlos went to Paris, where, Mar. 3, 1876, he proclaimed: "Being desirous of putting a stop to bloodshed, I forbear continuing a glorious but at present fruitless struggle. In the face of a great superiority of numbers, and in view especially of the sufferings of my volunteers, it becomes necessary to return the sword to the scabbard. I will never sign a convention [abandonment of all claims]." He was expelled from France, in 1881, for ostentatiously supporting the cause of the Duc de Chambord. Don Carlos has five children, four daughters and a son.

CARLOS, San, a t. of Venezuela, South America, in a valley on the Aguare, a feeder of the Orinoco, 120 m. s.w. of Caracas. Before the wars of independence it was a place of considerable importance, having been one of the richest towns in the province. The town is handsome and well laid out. The pop. was formerly 10,000, but is now considerably less. The inhabitants are engaged chiefly in the rearing of cattle, and the cultivation of indigo, cotton, and coffee, of which there are still considerable plantations in the neighboring savannahs.

CARLOS DE BOURBON, Don Maria Isidor, b. Mar. 29, 1788, was the second son of Charles IV. of Spain, and was educated chiefly by priests. After the expulsion of the French from Spain, his brother, Ferdinand VII., reascended the throne; but having married thrice without issue, Don C. began to cherish the hope of succeeding his brother. An insurrection in his interest broke out in 1825, in Catalonia; but was put down, Don C. himself not participating in it. A fourth time, however, the indefatigable Ferdinand married, and the result was a daughter, the infanta Maria Isabella (late queen of Spain), b. Oct. 10, 1830. Now, as the Salic law, excluding females from succession to the throne, had been abrogated, the hopes of the Carlists, as the followers of Don C. were called, were destroyed. During the illness of the king, in Sept. 1832, the Carlists succeeded so far as to win from him a re-institution of the Salic law; but he revoked it again as soon as he had partially recovered, and thus Don C. was again disappointed. As he still continued his agitation, he was banished, in 1833, to Portugal, and soon afterwards was commanded to reside in the papal states. But before C. had embarked for Italy, king Ferdinand VII. died, Sept. 29, 1833. Don C. was now recognized as heir to the throne of Spain, not only by the Carlists but also by Dom Miguel in Portugal; and having refused to obey the queen-regent's order for his deportation to Italy, he was declared a rebel, Oct. 16, 1833. By the quadruple alliance of Spain, Portugal, England, and France, both C. and Dom Miguel were banished from Portugal, and in June, 1834, the former embarked for England. In the following month, he returned to the continent, passed in disguise through France into Spain, where he excited an insurrection in the northern provinces, but was ultimately com-

pelled to escape into France. In 1836, his claims to the throne were unanimously rejected by the constituent cortes. In 1844, he abdicated in favor of his eldest son; and died at Trieste, Mar. 10, 1855.—Don Carlos, his son, b. 1818, was better known as the count de Montemolin. This second pretender made an attempt, in 1849, to pass under a disguise through France into Spain, but failed. In 1860, a Carlist insurrection was once more attempted, in consequence of which the count de Montemolin and his brother were arrested, but liberated after the former had signed a renunciation of all his claims to the Spanish throne. He d. in 1861. The present representative of his pretensions is his nephew, Don Carlos, son of his brother Juan, b. 1848. On his behalf, Carlist risings—speedily repressed—took place in 1869, 1870, and 1872; but the insurrection headed by Don Carlos, after the abdication of king Amadeo, in 1873, proved much more formidable, and kept the northern provinces of Spain in great confusion till the beginning of 1876, when it was crushed. See Carlos, Maria de los, etc.

CARLOVINGIANS, the second dynasty of Frankish kings. The origin of the family is traced to Arnulph, bishop of Metz, who d. in 631. His son, Anségise, married a daughter of Pepin, of Landen, in Austrasia. His sons, Martin and Pepin d'Heristall (q.v.), as the greatest territorial lords in Austrasia, were called to the office of mayor of the palace. Martin was assassinated; Pepin, by force of arms, compelled the weak Merovingian king, Theodoric III., to invest him with the office of mayor of the palace in all the three Frankish states, Neustria, Austrasia, and Burgundy. Pepin allowed the Merovingian kings to remain upon the throne, but they were kings only in name. He d. on 17th Dec., 714, and left as his successor, his young grandson, Theodoald; but Charles Martel (q.v.), a natural son of Pepin, was made mayor of the palace by the Austrasians, and in this capacity subjected the three states to his power. He d. in 741. His two sons, Carloman and Pepin le bref, divided the kingdom, although for a time the nominal Merovingian dynasty still subsisted; but Pepin at last formally assumed the royal power, and was crowned king of the Franks on 3d May, 752. This is the formal commencement of the Carlovingian dynasty. Pepin began the conquest of Italy. His sons, Carloman and Charles the great or Charlemagne (q.v.), succeeded him, of whom the latter soon reigned alone, and prodigiously extended his dominious. In 800, pope Leo. III. set upon his head the crown of the western Roman empire. He divided his dominions amongst his sons, of whom, however, only one, Louis le débonnaire, survived him, who, in the list of the kings of France, appears as Louis I., but who was properly emperor and king of the Franks. With Charlemagne, however, the high abilities of his family suddenly disappeared, and his successors showed much weakness of character. Family feuds broke out during the life of Louis le débonnaire, who had divided his dominions in part amongst his sons, and he terminated an inglorious reign in 840. By a treaty concluded in Aug., 843, Lotharius I., the eldest son of Louis, obtained the imperial crown and the kingdom of Italy, with Lorraine, Franche Comté, Provence, and the Lyonnois; Louis, his brother, called Louis the German, obtained the German part of his father's dominions; and Charles the bald, the son of a second marriage, obtained Neustria, Aquitania, and the *Spanish Mark*, and may almost be regarded as the founder of the French monarchy. The emperer Lotharius I. died in 855, and his dominions were again dividid—his eldest son, Louis II., being emperor and king of Italy, and his two other sons kings of Lorraine and of Provence, but their kingdoms reverted to the emperor.—Charles the fat, a son of Louis the German, having become emperor, was elected by the French nobles to be their king in 882; and being previously in possession of Italy and Germany, united under his sway great part of Charlemagne's empire. But he was a weak monarch, and was deposed in 887. The imperial dignity passed by the marriage of the daughter of the emperor Arnulph with Fritzlar, count of Franconia, to another family. The French dynasty, of which Charles the bald may be deemed the founder, continued in a succession of weak monarchs for about a century, till it terminated with the reign of Louis V., on whose death, Hugh Capet, the most powerful nobleman in France, seized the crown in 987. The Carlovingian kings had for some time previous possessed no real power. A subsequent marriage, however, connected their family with that of the Capets, and enabled the kings of France to trace their descent from Charlemange.

The Carlovingian dynasty figures in the early history of France as the ally of the church. It aided the popes against the Lombards; made war on the Aquitanians, who pillaged and despoiled the churches; established the temporal power of the successors of St. Peter; subdued and converted the still pagan Saxons; and fought the Mohammedans in Spain. Nor, on the other hand, do we find the church ungrateful: it sanctioned, by benediction and prayer, the conquests of this powerful family; in various ways impressed its sacred stamp of approbation upon it, and for its sake resuscitated the imposing idea of an empire of the west. But this alliance, which was advantageous to the policy of kings like Pepin le Bref and his son Charlemagne, because they had genius, vigor, and design, became at a later period, under their feeble successors, a chief cause of the overthrow of the dynasty, for the clergy, after 814, grew stronger and more exacting every day, and forced the monarchs to new concessions.

CARLOVITZ, or Karlovitz, a t. of the Austrian empire, in the "kingdom" or province of Slavonia. It is situated on the right bank of the Danube, about 8 m. s.s.e.

of Peterwardein, and is noted for its excellent wine, and for the treaty concluded here in 1699. The wine—especially the red variety—ranks with the best and strongest obtained in Hungary, and in some years the product has amounted to about 1¾ million of gallons. Pop. '69, 4,419. The important treaty or peace of C. was concluded, in 1699, between the allies Austria, Russia, Poland, and Venice on one side, and the porte on the other, and included the following articles: "That Austria should repossess the territories captured by the Turks during two centuries (which included Hungary and Slavonia, and she also acquired Transylvania); that Venice should hold the Morea as far as the isthmus; that Poland should take back Podolia and the lands in the Ukraine conquered by Mohammed IV., but should cede certain places in Moldavia; and that Russia should have the territory of Azof."

CARLOW, the capital t. of Carlow co., Ireland, situated at the confluence of the Burren and the Barrow, 56 m. s.w. of Dublin by rail. It is a well-built town, with two principal streets, from which branch many smaller ones, and a suburb, Graigue, in Queen's co., on the opposite side of the river, with which it is connected by a bridge. It has a Roman Catholic cathedral and divinity college. C. has extensive flour-mills, and is the emporium for the agricultural produce of the district, largely exported from this place. Pop. '81, 7,185. It returns one member to parliament. There are here the remains of a castle, picturesquely situated on an eminence on the Barrow, founded in 1180 by sir Hugh de Lacy. In 1361, the duke of Clarence established the exchequer of the kingdom in this place. It constituted one of the boundaries of the PALE, beyond which the king's writ was not recognized by the "Irishry." Its first charter was granted in the 13th c. by William Marshall, earl of Pembroke. The town grew up around this castle, which was several times besieged by, and alternately in the possession of, the English and Irish. The castle (one of great extent) was in the possession of the insurgents in 1650, when it was closely invested by gen. Ireton and the republican army. The garrison surrendered on conditions to sir Hardress Waller, whom Ireton had left to conduct the siege. It was then dismantled; and about one half of this once stately castle now remains a picturesque ruin. In the Irish insurrection of 1798, the insurgents attacked the town, but were repulsed by the garrison and yeomanry, and 600 of them killed. The Barrow is here navigable for small-craft to its junction with the Grand canal at Athy.

CARLOW, a small inland co. of Ireland, in Leinster province, with an area of about 346 sq.m., of which ⅘ths are arable. C., except in the southern extremity, where it is hilly, is a triangular fertile level, or gently undulating plain, between the Wicklow and Wexford range of hills on the e., and the highlands beyond the Barrow on the west. The chief rivers are the Barrow and Slaney. C. consists chiefly of granite, covered in the middle plain, or richer tracts, by limestone gravel, on which are fine loams and pasture. In the uplands, the soil is gravelly. Lower, carboniferous limestone crops out in the valley of the Barrow. On the w. side of the co. begins the great coal district of Leinster. In 1876, 79,345 acres were under crop, the chief crops being oats, potatoes, barley, and wheat. There are many dairies on the plains. The chief exports are corn, flour, meal, butter, etc. Along the Barrow, which falls above a foot per mile, are a great many extensive corn-mills. Pop. '41, 86,228; '51, 68,059; '81, 46,508. It returns three members to parliament—two for the co. at large, and one for the borough of Carlow. The chief towns are Carlow, Tullow, and Bagenalstown. At Old Leighlin a synod was held, in 630, to settle the time of Easter. Several engagements occurred in the co. during the Irish rebellion of 1798. The chief antiquities of C. are cromlechs, castles, and the cathedral church of Old Leighlin. A cromlech near Carlow town has a covering stone 23 ft. long, and of nearly 90 tons.

CARLOWITZ, or CARLOVITZ, a t. in Hungary, on the right bank of the Danube, 8 m. s.e. of Peterwardein; pop. '73, 4,419. It is the seat of the Greek archbishop for the Austrian dominions, and has seminaries for Greek and Roman Catholic clergy, a gymnasium, a lyceum, and a hospital. It was here that peace between Austria, Turkey, Poland, and Venice was concluded in 1699.

CARLSBAD, or KAISER-KARLSBAD, a t. in Bohemia, much celebrated for its hot mineral springs, and frequented in summer by visitors of the most aristocratic character from all parts of Europe. The permanent population does not amount to more than about 7,000, who are very industrious, making carpets, knives, scissors, needles, woodwork, and articles of Bohemian glass, such as are likely to induce visitors to purchase. The visitors in a season, which usually lasts from 15th June to 15th Aug., amount to 15,000 or 18,000. The wells have been frequented from a very early period, but have been of great celebrity since the 14th century. The scenery is extremely beautiful. The town is well built, the accommodation for guests good, and the place free from some of the abuses too common at other German spas. No gaming-houses exist here. The temperature of the hot springs varies from 117° to 165° Fahrenheit. The principal spring, the Sprudel, has a very large volume, and is forced up to a height of 3 ft. from the ground. Altogether, the daily flow of the springs of C. is estimated at 2,000,000 gallons. The principal ingredient in the water is sulphate of soda. The whole town of C. appears to stand on a vast caldron of boiling water, which is kept from bursting only by the safety-valves the springs provide. On one occasion, after an

explosion, poles of 30 fathoms in length, thrust into the aperture, did not reach the bottom. A congress of German powers was held here in Aug., 1819, in which various resolutions, denunciatory of a free press and liberal opinions, were arrived at, and measures of repression determined on.

CARLS'BURG, or KARLSBURG, a t. of Transylvania, situated on the right bank of the Maros, here crossed by a bridge some 200 yards in length, 48 m. s. of Klausenburg. It is built partly on a hill, and partly in a valley, is fortified, and has a citadel surrounded by walls with bastions. Gold and silver, obtained from the mines of Transylvania, are purified and coined here. The only manufacture of importance is saltpeter. Maros Porto, the chief shipping-place for Transylvanian rock-salt, is within half a mile of the town. C. occupies the site of the ancient *Apulum*, remains of which are still found. Pop. '80, 7,955.

CARLSCRO'NA, capital of the province of the same name in Sweden, is situated on the rocky island of Trotsö, and its adjoining islets in the Baltic, which are connected by bridges, in lat. 56° 9′ n., long. 15° 35′ east. The town was built in 1680 by Charles XI., who gave it his own name, and conferred upon it several important privileges, besides making it the great naval station and arsenal of Sweden, instead of Stockholm. It has a magnificent harbor, with a sufficient depth of water to float the largest vessels. The only practicable entrance for large ships is defended by two strong forts. The dry-docks, blasted out of the granite rock at vast expense, are an attraction to strangers. The inhabitants are chiefly employed in connection with the arsenal. Pop. '80, 18,300.

The province of C. or Blekinge is situated in the s. of Sweden, in lat 56° to 56° 30′ n., long. 14° 30′ to 16° east. It has the Baltic on its s. and e. margins. It has an area of about 1120 sq.m, with a pop. of 131,812. It is hilly without being mountainous, and generally fertile, yielding rye and potatoes abundantly, and also wheat, oats, and peas. The fisheries employ a considerable number of the inhabitants.

CARLSHAMN, a fortified t. on the s. coast of Sweden, about 30 m. w. of Carlscrona, at the end of a beautiful valley. The harbor is small but secure, and a considerable trade in iron, timber, pitch, and tar is carried on. There are manufactures of sail-cloth, tobacco, hats, soap, and leather; there are also dye-works and ship-building yards. Pop. 5,731.

CARLSRUHE, the capital of the grand duchy of Baden, is situated a few miles eastward from the Rhine. It was founded by the Markgraf Charles-William of Baden-Durlach, in 1715, and built on a curious and regular plan in connection with the palace, which constitutes the center point from which the streets, so far as constructed, diverge in the shape of an extended fan. The streets are wide and well paved. There are a number of fine buildings; flourishing educational institutions; the court library contains 80,000 volumes; a public library, 90,000; and there are valuable collections of antiquities, objects of natural history, etc. An aqueduct from the Durlach supplies the town with water. In the market-place, which is the finest of the public squares, a stone pyramid incloses the remains of the founder of the city. The manufactures include machines of various sorts, engines, locomotives, railway carriages and wagons, jewelry, carpets, chemical products, and cloth. C. is generally spelled *Karlsruhe*. Pop. '80, 49,283.

CARLSTAD, a t. of Sweden, on the island of Tingvalla, in lake Wenern, about 160 m. w. of Stockholm. It is connected with the mainland by two bridges, one of which is a large and very handsome structure. The town is well built, has a cathedral, cabinet of natural history, etc., and commands extensive views of the most beautiful scenery. Its trade is large, consisting in exports of iron, copper, timber, and corn. Pop. '80, 7,772.

CARLSTADT, a t. of Croatia, in Austria, situated in a rich plain between the rivers Kulpa and Korona, 33 m. s.w. of Agram. It is fortified—the original fortress having been erected in the 16th c. to resist the Turks—has an old castle, and armory of 30,000 stand of arms. It has a large garrison, the Austrian executive looking upon it as a place of considerable importance, on account of its position on a navigable river, and on the great road into the center of Croatia from the coast. It has few manufactures, but an active transit trade. Pop. '69, 5,175.

CARLSTADT, KARLSTADT, or KAROLOSTADT (real name, ANDREAS RUDOLF BODENSTEIN), 1480–1541; a German reformer, at first a friend and afterwards an opponent of Luther. He became a professor in Wittenberg, first in philosophy and then in theology, and in 1511 was rector of the university, about which time he became a personal friend of Luther. Carlstadt went to Rome to study canon law, returning to Wittenberg in 1515, where he took up the defense of Reuchlin, the scholar against whom a violent persecution was raging. In 1517, he published arguments asserting the supreme authority of the Scriptures, and declaring that in the silence of Scripture, appeals from the fathers of the church must be made to reason. When Luther nailed his thesis to the door of the church, Carlstadt supported him. In the bill against Luther, Carlstadt was especially named and condemned; and he was the first to appeal from the pope to a general council. In 1521, by invitation of the king, he went to Denmark to

teach the doctrines of the reformation; but he soon returned. About this time, differences sprang up between Carlstadt and Luther, owing to the former's hot-headedness; he demanded violent measures, where Luther desired prudence and patience. While Luther was imprisoned, Carlstadt greatly impaired the cause by his extreme course, and at last Luther declared against him. Being compelled to leave Wittenberg, Carlstadt became a pastor in Thuringia, where his violence created a suspicion that he was associated with Anabaptists, and that he might be implicated in the schemes of the peasant revolt. The elector sent Luther to find out the true state of affairs; and when Luther preached against Carlstadt at Jena, they held a discussion on the "real presence," which Carlstadt was the first to deny, and an open quarrel broke out between them. Carlstadt was ordered out of Saxony, and wandered from place to place exciting tumults, and prompting the people to destroy pictures and images in the churches. Again suspected of provoking insurrection, he was pursued and exposed to hardships, and even danger to his life. In this extremity he appealed to Luther, through whose influence he was permitted to return to Saxony, where for some years he led a quiet life. This quiet was unendurable by his restless spirit, and he once more attacked Luther; the controversy, in which Zwingli agreed with Carlstadt in his views of the Lord's supper, grew fiercer than ever, and Carlstadt, who was no longer permitted to dwell in Saxony, fled to Friesland, and thence to Switzerland, where Zwingli's influence made him a pastor, and afterwards an archdeacon at Zurich. In 1534, he settled as professor of theology in Basel, remaining there until his death. He was the first priest to write against celibacy, and the first Protestant clergyman to take a wife.

CARLTON, a co. in n.e. Minnesota, on the Wisconsin border, intersected by the Northern Pacific and Lake Superior railroads; 900 sq.m.; pop. '80, 1230. Surface uneven, and for the most part covered with maple and pine trees.

CARLTON, Thomas, D.D., 1809–74; b. N. H.; a Methodist minister, who in 1829 began his work in the Western New York conference in Rochester, Buffalo, and other places. He was for 20 years the principal agent of the Methodist book concern, in New York city.

CARLUDOVI'CA PALMA'TA, a South American shrub or tree bearing the leaves from which Panama hats are woven, the best of which are plaited from a single leaf, the work requiring many weeks of labor.

CARLUKE', a municipal burgh in the middle of Lanarkshire, near the right bank of the Clyde, 6 m. n.w. of Lanark. Pop. '71, 3,423. The neighborhood is rich in coal, iron, and limestone, and mining is the chief industry of the place. The orchards around cover 130 acres. Not far off is Lee, the seat of the Lockharts, where is preserved the famous Lee penny, noticed by sir W. Scott in the *Talisman*. Roman coins have been found here. Gen. Roy, the antiquary, author of the *Military Antiquities of the Romans in North Britain*, was a native of Carluke.

CARLYLE, Joseph Dacre, 1759–1804; educated at Cambridge, and a fellow of Queens' college. He succeeded Dr. Paley as chancellor of Carlisle, and in 1794 was appointed professor of Arabic at Cambridge. He had already published a translation of an Arabic history of Egypt, and in 1796 he issued a volume of *Specimens of Arabic Poetry*. Lord Elgin procured Carlyle's appointment in the Turkish embassy, which gave him an opportunity to travel in the east, where he collected Greek and Syriac manuscripts for a contemplated revision of the New Testament, but he did not live to do the work.

***CARLYLE**, Thomas, was b. 4th Dec., 1795, in the t. of Ecclefechan, parish of Hoddam, Dumfriesshire, Scotland. Educated first at the parish school, and afterwards at Annan, he passed to Edinburgh university, with a view to entering the Scottish church, in his 15th or 16th year. Here he studied irregularly, but with amazing avidity. The stories which are related of his immense reading are almost fabulous. About the middle of his theological curriculum, C. felt wholly disinclined to become a clergyman, and, after a short period spent in teaching at Dysart, in Fifeshire, he embraced literature as a profession. His first efforts were contributions to Brewster's *Encyclopædia*. In 1824, he published a translation of Legendre's *Geometry*, to which he prefixed an essay on proportion, mathematics having, during his college years, been a favorite study with him. In 1823–1824, had appeared in the *London Magazine* his *Life of Schiller*, and, during the same year, his translation of Goethe's *Wilhelm Meister*. In 1825, the *Life of Schiller* was recast, and published in a separate form. It was very highly praised; indeed, one can discern in the criticisms of the book certain indications of the genius of Carlyle. The translation of *Wilhelm Meister* met with a somewhat different fate. De Quincey, in one of his acrid and capricious moods, fell foul both of Goethe and his translator; while lord Jeffrey, in the *Edinburgh Review*, admitting C. to be "a person of talents," slashed in cavalier fashion at the book. In 1827, C. married Miss Welch, a lineal descendant of John Knox, and, during the same year, appeared his *Specimens of German Romance* (4 vols., Tait, Edinburgh). From 1827 to 1834, he resided chiefly at Craigenputtoch, a small property in Dumfriesshire, belonging to his wife—the "loneliest nook in Britain," as he says himself in a letter to Goethe, "fifteen

m n.w. of Dumfries, among the granite hills and the black morasses which stretch westward through Galloway almost to the Irish sea." Here C. revolved in his mind the great questions in philosophy, literature, social life, and politics, to the elucidation of which—after his own singular fashion—he has earnestly dedicated his whole life. Here, also, he commenced to write the splendid series of critical and biographical essays which first familiarized Englishmen with the riches of modern German thought. For this work, he was incomparably better fitted than any man then living in Great Britain. Possessing a knowledge of the German tongue such as no foreigner ever surpassed, he was also inspired by the conviction, that the literature of Germany, in depth, truthfulness, sincerity, and earnestness of purpose, was greatly superior to what was admired and relished at home. Gifted, moreover, in a degree altogether unexampled, with a talent for portraiture, he soon painted in ineffaceable colors on the British memory, the images of Schiller, Fichte, Jean Paul Richter, and other foreign magnates, until then almost unheard of. Gradually, educated circles awoke to the fact, that a literary Columbus had appeared among them, who had discovered a "new world" of letters, the freshness and grandeur of which were sure to attract, sooner or later, multitudes of adventurous spirits. One of his most beautiful, eloquent, and solid essays written at Craigenputtoch, was that on *Burns* (*Edinburgh Review*, 1828). It has given the tone to all subsequent criticism on the Scottish poet. The article on *German Literature*, in the same periodical, is a masterly review of a subject, the importance of which C. at length succeeded in compelling his countrymen to acknowledge. But his *chef-d'œuvre* written on the moorland farm, was *Sartor Resartus* ("the tailor done over," the title of an old Scottish song). This work, like all his after-productions, an indescribable mixture of the sublime and the grotesque, was offered to various London firms, and rejected on the advice of their sapient "tasters," and at length published in successive portions in *Fraser's Magazine* (1833–34). It professes to be a history or biography of a certain Herr Teufelsdröckh ("Devil's Dirt"), professor in the university of Weissnichtwo ("Kennaquhair"), and contains the manifold opinions, speculations, inward agonies, and trials of that strange personage—or rather of C. himself. The whole book quivers with tragic pathos, solemn aspiration, or riotous humor. Carlyle removed to London, at about this time. In 1837, appeared the first work which bore the author's name, *The French Revolution, a History*. Nothing can be more gorgeous than the style of this "prose epic." A fiery enthusiasm pervades it, now softened with tenderness, and again darkened with grim mockery, making it throughout the most wonderful image of that wild epoch. C. looks on the explosion of national wrath as a work of the divine Nemesis, who "in the fullness of times" destroys, with sacred fury, the accumulated falsehoods of centuries. To him, therefore, the revolution is a "truth clad in hell-fire." During the same year, he delivered in London a series of lectures on *German Literature;* in 1838, another series on *The History of Literature, or the Successive Periods of European Culture;* in 1839, another on *The Revolutions of Modern Europe;* and a fourth in 1840, on *Heroes, Hero-Worship, and the Heroic in History;* of these only the last has been published. Meanwhile, the first edition of his *Miscellanies* (contributions to the reviews) had appeared in 1838, and his *Chartism* in 1839. In 1843, followed *Past and Present*, which, like its predecessor, showed the deep, anxious, sorrowful interest C. was taking in the actual condition of his countrymen. In 1845, he published what is by many considered his masterpiece—*Oliver Cromwell's Letters and Speeches, with Elucidations and a Connecting Narrative.* The research displayed in this book is something marvelous, but the author has been nobly rewarded for his toil, inasmuch as his vindication of the protector's character is most triumphant. To C. has thus fallen the unspeakable honor of replacing in the pantheon of English history the statue of England's greatest ruler. In 1850, the *Latter-Day Pamphlets*, the fiercest, most sardonic, most furious of all his writings, came out. The violence of the language in these pamphlets offended many. Next year (1851) appeared the *Life of John Sterling*—a biography of intense fascination for the younger intellects of the age. In 1858–1860, C. published *The History of Frederick the Great;* and, in 1875, *Early Kings of Norway: Also The Portraits of John Knox.* C. was elected lord rector of Edinburgh university in 1865; and, in 1873, received the Prussian royal order "for merit." In 1875, he was offered but refused the order of the bath. He d., London, 1881, Feb. 5.

That C.'s *genius* will never want ample recognition, is most certain; but his *writings* derive so much of their interest and power from what is peculiar to, or at least characteristic of, the present time, that future ages may possibly wonder at their fiery splendors, and fail to sympathize with their prophetic enthusiasms. See *Supp.*, page 889.

CARMAGNO'LA, a t. of n. Italy, situated near the left bank of the Po, about 16 m. s. of Turin. It has a massive old tower, the remains of a very strong castle, which formerly served as a defense for the town. The *condottiere*, Francesco Bussone, afterwards Conte di Carmagnola, was a native of this place. It has manufactures of jewelry, and a trade in silk, flax, linen, cattle, and agricultural produce. Pop. 12,512.

CARMAGNO'LA, Francesco Bussone, Count of, 1390–1432; a celebrated brigand, at first in the service of the duke of Milan, who made him count and governor of Genoa. Having fallen from the duke's favor, Carmagnola became a gen. in the Venetian army, and took Brescia from his former master, whom he defeated in 1427. In 1431, he incur-

red the suspicion of the Venetian senate because of certain military failures, in consequence of which he was tortured and finally beheaded.

CARMAGNOLE, the name of a popular song and dance, which was notorious as the accompaniment of many excesses in the French revolution. It first became popular in the s. of France, where it was named after Carmagnole, in Piedmont, the home of many Savoyard boys who played the tune. The song began with:

Madame Véto avait promis,

and every verse ended with the refrain:

Dansons la Carmagnole—vive le son—du canon!

Fashion soon adopted the word, which was next applied to a sort of jacket, worn as a symbol of patriotism. Afterwards it was applied to the bombastic and fanatical reports of the successes and glory of the French arms. With the reign of terror, the song and the jacket, associated with so many dismal recollections, together disappeared.

CARMAR'THEN. See CAERMARTHEN, *ante.*

CARMEL is a mountain-ridge, 6 or 8 m. long, stretching nearly n. and s. from the plain of Esdraelon into the sea, the only great promontory on the low coast of Palestine. It is composed of a whitish stone, in which flints, sometimes curiously shaped, are imbedded. The height has been variously stated, but is probably about 1000 ft. above the level of the plain. On the e. is the river Kishon, and the plain of Esdraelon; on the w., a small plain descending to the sea. Oaks, pines, olives, laurels, and other trees grow abundantly on the mountain; and various wild-fruits evince its ancient fertility and cultivation. The name C. means *the garden of God,* or "a very fruitful region." Mt. C. is renowned in Jewish history, and is often alluded to in the imagery of the prophets. On the summit of Mt. C., there is a monastery called Elias, after the prophet Elijah, the monks of which take the name of "Carmelites." It is built on the supposed site of the grotto where Elijah lived, and the spot where he slew the priests of Baal. For an invalid in search of retirement, with every beauty that climate and natural scenery can offer, there can be no place superior to the convent on Carmel.

CARMEL, KNIGHTS OF THE ORDER OF OUR LADY OF MOUNT, were instituted by Henry IV. of France, and incorporated with the order of the knights of St. Lazarus of Jerusalem. The order of Mt. C. consisted of 100 gentlemen, all French, who were to attend the king in his wars, and had considerable revenues assigned to them. The order was confirmed by bull by pope Paul V., in 1607. The great master was created by the king putting about his neck a tawny ribbon, suspending a cross of gold, with the cloak of the order, and granting him power to raise 100 knights. None were admitted but those who had four descents of nobility both by father and mother.

CARMELITES, or ORDER OF OUR LADY OF MOUNT CARMEL, a monastic order probably founded as an association of hermits on Mt. Carmel by Berthold, count of Limoges, about 1156. A legend, however, ascribes the foundation of the order to the prophet Elijah; and another makes the Virgin Mary to have been a Carmelite nun. Driven out by the Saracens in the 13th c., the C. wandered over Europe; and Simon Stoch, their general, changed them into a mendicant order in 1247. From that time, they shared in the usual vices of the mendicant orders. They subsequently divided into several branches, more or less rigid in their rules, one distinguished by walking barefooted. They exist at the present day in many Roman Catholic countries.—The order of *Carmelitesses,* or *Carmelite nuns,* was instituted in 1452, and is very numerous in Italy.

CARMICHAEL, GERSHOM, 1672–1729; a Scotch metaphysician, educated at Edinburgh university, in which institution he became a master, an office which was converted to the professorship of moral philosophy in 1727. He was a successful teacher, but often in difficulty with his superiors in consequence of his hasty temper. His works are a treatise on logic and the psychology of the intellectual powers, in which he affirms that all knowledge may be resolved into immediate judgments known in their own light; a synopsis of natural theology; and an edition of Puffendorf's *De Officio Hominis et Civis.*

CARMINATIVES (from Lat. *carmen,* a charm), medicines to relieve flatulence and pain in the bowels, such as cardamoms, peppermint, ginger, and other stimulating aromatics.

CARMINE, or CARMIN (Arabic, *kermes*), is a beautiful red pigment obtained from cochineal, and which is employed in the manufacture of the finer red inks, in the dyeing of silk, in coloring artificial flowers, and in miniature and water-color painting. It was first prepared by a Franciscan monk at Pisa, who discovered it accidentally, while compounding some medicine containing cochineal; and in 1656, it began to be manufactured. It is the finest red color known, and was more largely used formerly than now for imparting a healthy aspect to the cheek of beauty. One process for its preparation is to digest 1 lb. of cochineal in 3 gallons of water, for 15 minutes; then add 1 oz. of cream of tartar; heat gently for 10 minutes; add half an oz. of alum; boil for 2 or 3 minutes; and after allowing any impurities to settle, the clear liquid is placed in clean glass pans, when the C. is slowly deposited. After a time, the liquid is drained off, and the C. dried in the shade. In the preparation of C., much depends on a clear atmosphere, and a bright sunny day, as the pretty color of the C. is never nearly so good when it has been prepared in dull weather, and this accounts in great part for the superiority of

French C. over that prepared in England. The great expense of pure C. has led to the fabrication and vending of substitutes. The *rouge* of the theaters is made from red sandal-wood, Brazil wood, benzoin, and alum, which are boiled in brandy or vinegar till a paint of an intense red color remains. A more harmless material is obtained by evaporating the mixture till the liquid is driven off, and making up the red residue with balm of Mecca, spermaceti, or butter of cacao. The depth of the red tint may be lessened by the addition of chalk. The little color-saucers called *rouge dishes*, obtained from Portugal, contain pure C.; but imitations are made in London. *Spanish wool* and *oriental wool*, which are impregnated with red paint, intended for use on the cheek for improving the complexion, are seldom genuine.

CARMÖÉ, or KARMÖE, an island of Norway, at the entrance of the Bukke fiord, in the North sea, and 20 m. n.w. of Stavanger, in lat. 59° 20′ n., long. 5° 15′ east. A strait 2 m. in width separates it from the mainland. With a length of 21 m., and an average breadth of 5, it has a population of 6,400, who are principally engaged in the fisheries, and in cattle-rearing.

CARMO'NA, a t. of Andalusia, Spain, 20 m. n.e. of Seville. It is situated on an elevated ridge, overlooking a rich and olive-clad plain, and its old massive Moorish walls and castle give it a very picturesque appearance. It has a fine old Gothic church, and the gate of Cordova is a most interesting piece of architecture. It has manufactures of woolen cloth, hats, leather; also flour and oil mills, and an important annual cattle-fair. Pop. 18,000.

CARNAC, a village in the department of Morbihan, France, 17 m. s.e. of Lorient. It is remarkable on account of the great Celtic monument situated about three quarters of a mile from the village, on a wide desolate plain near the sea-shore. The monument consists of 10,000 to 12,000 rude broken obelisks of granite, resting with their smaller ends in the ground, rising, many of them, to a height of 18 ft., though a large proportion does not exceed 3 ft., and arranged in 11 parallel rows, forming 10 avenues extending from e. to w., and having at one end a curved row of 18 stones, the extremities of which touch the outer horizontal rows. The origin and object of the monument remain a mystery. Similar but smaller structures are found to the w. of C., at Erdevan and St. Barbe. Pop. '76, 636.

CARNAHUBA PALM, or CARANAIBA PALM, *Copernicia cerifera*, a very beautiful species of palm, which abounds in the northern parts of Brazil, in some places forming vast forests. It attains a height of only 20 to 40 ft.; but its timber is valuable, is used in Brazil for a great variety of purposes, and is imported into Britain for veneering. The fruit is black, and about the size of an olive; it is sweet, and is eaten both raw and prepared in various ways. Scales of wax cover the under side of the leaves, and drop off when the fallen and withered leaves are shaken. Being collected in this way, the wax is melted into masses; and bees-wax is often adulterated with it. It has been imported into Britain, and used in the manufacture of candles, but no method has yet been devised to free it of its yellowish color.

CARNA'RIA (Lat. *caro, carnis*, flesh), the Latinized form of the French *carnassiers*, the name given by Cuvier to a great order of *mammalia*, which, according to his system, includes all the not marsupial *feræ* of Linnæus, and along with them the bats, from the Linnæan order *primates*. The C. have the toes terminated by claws; none of them have an opposable thumb on any of the extremities; they have incisors or cutting teeth, canine teeth or tusks, and molar teeth or grinders, but their dentition varies according to their kind of food, some preying on insects, others on the higher animals, whilst many of them are by no means exclusively addicted to animal food, but subsist in great part, and a few bats entirely, on vegetable substances. Cuvier at first included the marsupial quadrupeds in this order; but afterwards, recognizing more fully the great importance of the characteristic from which they derive their name, constituted them into a distinct order, the remaining C. being divided into *cheiroptera* (bats, q.v.), *insectivora* (q.v.), and *carnivora* (q.v.).

CARNARVON, HENRY HOWARD MOLYNEUX HERBERT, fourth earl of, b. in Grosvenor square, 1831. His family is a branch of the house of Herbert, earls of Pembroke, springing from maj.gen. the Hon. W. Herbert, whose son, Henry, was created, in 1780, baron Porchester of Highclere, Hampshire, and advanced to the earldom of Carnarvon in 1793. The present earl was educated at Christ church, Oxford, where he was first-class in classics in 1852. His father dying before he was of age to sit in the house of commons, he lost the advantage of the training in public speaking and statesmanship which the sons of peers usually enjoy during the lifetime of their parents, in the lower house. He took his seat on the conservative benches, and soon showed himself ambitious of parliamentary distinction. His earlier speeches in the house of lords were not thought to exhibit much vigor and grasp of intellect, and were marred by a simpering and affected delivery. He was appointed governor of Carnarvon castle in 1854. In 1858, he became under-secretary of state for the colonies, in the administration of the earl of Derby. In 1859, he received the degree of D.C.L., and was elected high steward of the university of Oxford. He resigned office with the conservative ministry in 1859, and availed himself of the period of leisure thus obtained to visit the east. The feuds of the

tribes in the Lebanon had broken out in a massacre of the Christians; and the earl of C. gave the world the benefit of his investigations, in an interesting work, entitled the *Druses* (q.v.) *of the Lebanon.* On his return, he delivered lectures in the country, and speeches in the house of lords, on prison discipline, education, and other social subjects. When the conservaties again returned to power in 1866, C. accepted from lord Derby the office of secretary of state for the colonies, with a seat in the cabinet. In this he obtained for his colonial administration a large share of public confidence. He censured in calm and measured language the misconduct of the courts-martial during the Jamaica insurrection, and especially the trial and execution of Mr. Gordon; and the pacification of the colony satisfactorily progressed under his instructions. During the recess, he developed and framed a plan for the confederation of the British North American colonies; and when parliament met in 1867, he explained the provisions of the measure in an elaborate speech. The bill met with general approval in both houses, and it passed; but before it obtained the royal assent, C. had, with two other colleagues in the cabinet, resigned office upon the reform bill of the Derby government, which he regarded as democratic in its operation, and dangerous in its results. When the reform bill came before the house of lords, C., in an animated speech, vindicated his consistency at the expense of his colleagues; and in the discussions in committee, he addressed the house with great vigor and argumentative ability. He edited in 1869 a work by his father, who was an accomplished scholar. It is entitled *Reminiscences of Athens and the Morea; Extracts from a Journal of Travels in Greece during* 1839, *by the late Earl of Carnarvon.* He has also published one or two of his lectures. On Mr. Disraeli's return to power in 1874, lord C. resumed office as secretary of state for the colonies; but resigned in Jan., 1878, in consequence of the sending of the British fleet to the Dardanelles. Lord C. married, in 1861, the only daughter of the sixth earl of Chesterfield.

CARNAR'VON. See CAERNARVON, *ante.*

CARNAT'IC, a country of somewhat indefinite dimensions on the e. or Coromandel coast of the peninsula of Hindustan. While some carry it as far inland as the Western Ghauts, others limit its breadth to about 75 miles. The length is generally taken from cape Comorin to about 16° north. The C. is no longer a recognized division of the country, and exists only in history as the grand theater of the struggle of last century between France and England for supremacy in India.

CARNATION, one of the finest of florists' flowers, a double-flowering variety of the clove pink (*dianthus caryophyllus,* see PINK), and existing only in a state of cultivation. It has long been a universal favorite, both on account of its beauty and fragrance, although it does not appear to have been known to the ancients. The stem is about 3 ft. high, and generally receives support. There are varieties, called *tree carnations,* with much taller stems, but they are not amongst the varieties esteemed by florists. The flowers are often three inches or more in diameter. Scarlet, purple, and pink are the prevailing colors; but whatever are the colors of a C., it is of no value, in the eyes of a florist, unless they are perfectly distinct. Fullness and perfect regularity are also deemed essential. The varieties are extremely numerous: those which have only two colors, disposed in large stripes through the petals, are called *flake carnations;* those which have three shades of color, also in stripes, *bizarre carnations;* and those which have the flowers spotted with different colors, and the petals serrated or fringed, receive the name of *picotees.* Great attention is at present paid in Britain to the cultivation of the C., and very fine specmens are often to be seen in the gardens of cottagers, especially about towns and villages. The soil for carnations must be rich, rather open, and the manure well rotted and intimately mixed. The finest kinds are generally grown in pots, and receive protection from cold winds and heavy rains, although free access of air is indispensable. Carnations are propagated in summer either by layers or by *pipings,* which are short cuttings of shoots that have not yet flowered, each having two joints. The young plants are transferred in spring to the bed in which they are to flower.

CARNATION (from Lat. *caro,* flesh). Flesh-tints in painting are called carnations. The art of producing the true color of flesh, from the rarity with which it is acquired by artists, would seem to be one of the most difficult branches of coloring. Whether from their painting less from the nude than the old masters, or from some other cause, it is certain that the moderns, and particularly the English, have been very unsuccessful in this respect. It is said that the pigments must be laid on thick and pasty. The ochres are preferable to vermilion for the local colors; and ultramarine ashes, or Veronese green, mixed with asphaltum, may be used for the shadows.

CARNE'ADES, a Greek plilosopher, b. at Cyrene, in Africa, about 213 B.C. He studied logic at Athens under Diogenes, but became a partisan of the academy, and an enemy of the stoics, whose stern and almost dogmatic ethics did not suit his skeptical predilections. Conspicuous for his eloquence and skill in "tongue-fence," he was destitute of any convictions moral or intellectual, and had even arrived at the conclusion that no criterion of truth existed in man. In 155 B.C., along with Diogenes and Critolaus, he was sent as ambassador to Rome, where he delivered two orations on justice, in the first of which he eulogized the virtue, and in the second proved that it did not exist. Honest Cato, who had no relish for intellectual jugglery, and thought it a

knavish excellence at the best, moved the senate to send the philosopher home to his school, lest the Roman youth should be demoralized. C. died at Athens, 129 B.C. He was remarkable for his industry, negligent habits, and impatient temper.

CARNEGIE, ANDREW. See page 890.

CARNE'IA, a festival in honor of Apollo among the ancient Spartans, taking its name from the Greek name of the month (August) in which it was celebrated. The celebration lasted nine days.

CARNE'LIAN, or CORNELIAN, in mineralogy, the name given to some of the finer varieties of chalcedony (q.v.). The color is blood red or flesh-color, reddish brown, reddish white or yellow, more rarely milk white. The fracture is in the common C. perfectly conchoidal, but there is a variety of a somewhat fibrous structure with a splintery fracture. C. is found in pieces of irregular form and in lamellar concretions. The finest specimens are brought from the east, but it is found in Scotland and in many parts of Europe and America. It is much used by the lapidary, and in the east it is prized beyond every other stone, the gems excepted. Bright red C. of unmixed color is most highly valued, but a mass of considerable size is seldom found with the color equal throughout.

CARNIFEX FERRY, in Nicholas co., Va., near which, Sept. 10, 1861, there was an engagement between the union forces under gen. Rosecrans, and the confederates under gen. Floyd, the latter being defeated with the loss of camp equipage and war material. Floyd escaped by retreating over Gauly river, and destroying the bridge.

CARNIO'LA (Ger. *Krain*), a crown-land of the Austrian empire, formerly part of the kingdom of Illyria, has an area of 3,850 sq.m., with a pop. (1880) of 481,243, being a decrease of nearly 40,000 as compared with the census return of 1854. A continuation of the Carinthian Alps passes through it in the north, and the Julian Alps in the south. The scenery of the country abounds in interesting and singular features, amongst which one of the most notable is the rock-bridge of St. Kanzian, 130 ft. high, and 160 ft. broad, with a perfect arch 62 ft. high, and 154 ft. long. The Save is the principal river; the Kulpa is its chief tributary. The singular lake of Zirknitz (q.v.) is in Carniola. The climate of C. is in general mild, except in the high mountainous parts. The country does not produce corn or cattle enough to supply the wants of its inhabitants. Millet, pulse, and wild fruits are principal articles of food with many of the lower classes. Maize is cultivated in some places, and some districts yield excellent wines and much fine fruit. Flax is largely cultivated; silk is produced in some places, and much honey and beeswax. The principal products of the mineral kingdom are iron, quicksilver, and marble; the quicksilver mines of Idria are the most important in Europe. Linen-weaving, and the manufacture of a coarse lace, are common among the peasantry. Layback is the capital.

C. received its present name after the settlement here of the Slavonic Wends. Charlemagne conquered it and gave it to the dukes of Friuli. From 972 it had markgraves of its own, sometimes called dukes, who possessed, however, only a part of the country. On the extinction of the male line of the markgraves, part of the territory passed to the dukes of Austria, in the 13th c., and the remainder was acquired by them in the 14th. The vast majority of the inhabitants are Slavs of the Slovenian branch.

CARNIVAL (from the Lat. *caro*, flesh, and *vale*, farewell—"farewell to flesh!"), a festival in Italy, which originally began on the feast of the Epiphany, and continued to Ash-Wednesday, when the fast of Lent made an end of the preceding feasting, masquerading, and buffoonery. In later times, the C. was limited to the time of from three to eight days before Ash-Wednesday. Without doubt, the forms and customs still preserved in the celebration of the C. originated in the heathen festivals of spring-time; and they still remind us, partly of the Lupercalia and Bacchanalia of southern Europe, and partly of the Yule-feast among northern peoples. Banquets of rich meats and drinking-bouts were the chief attractions of the C. during the middle ages. Shrovetide (q.v.), or Shrove-Tuesday, called also Fasten-even or Pancake-Tuesday, was a relic of the English C., and formerly a season of extraordinary sport and feasting. The rich commenced the festive time at the feast of Epiphany, or on "Three Kings' Day;" but the middle classes restricted their days of revelry to the week immediately preceding Lent; while the poor indulged in only a few days of mad mirth. According to a papal order, the clergy were allowed to commence their bacchanalia two days before the laity. The several chief days of C. had distinct names, such as "fat" or "greasy Sunday," "blue Monday" (or "fool's consecration"), etc. The Tuesday before the beginning of Lent was especially styled C.—the *Fastnacht* of the German people. The customs of making presents of green nosegays or garlands, and planting fir-trees before houses during C., remind us of the *thyrsus* of the ancient Bacchanals, and equally of the decorations of the Yule-tide or Christmas season among northern people. The ancient custom, also, of scourging women accidentally met with during the Lupercalia (q.v.), was preserved in the mediæval observance of the carnival. In most countries, especially where Protestantism prevails, the observance of the C. is now limited to dancing and masked balls on certain days; but in Italy, as Goethe says in his charming sketch of the Roman C., it is still a general popular festive time. In former times, Venice was distinguished by the pomp and splendor of the C.; but afterwards, Rome became most prominent. The years of

angry politics, 1848 and 1849, had a discouraging effect on the attempts which had been made to restore the gayety of C. in the Roman Catholic towns of Germany.

CARNIV'ORA (Lat. flesh-devouring), in Cuvier's system of zoology, a principal division of the order of *mammalia* called *carnassiers* or *carnaria* (q.v.), and including the most *carnivorous* or sanguinary of the order—the quadrupeds which chiefly prey on the vertebrate and warm-blooded animals. The C. have six incisors or cutting teeth in each jaw; their tusks or canine teeth are very strong, and even their molar teeth or grinders are usually furnished with cutting edges. But even the C. are carnivorous in very different degrees, and some of them have teeth and other organs adapted to a partial use of some kinds of vegetable food. Cuvier subdivided the C. into three tribes, *plantigrada* (q.v.), *digitigrada* (q.v.), and *amphibia* (seals, q.v., etc.). The digestive apparatus of carnivorous animals is more simple than that of the herbivorous; the stomach is single, and in general of comparatively small size, and the intestines are comparatively short and unvoluminous. Their muscular energy is very great, their respiration and circulation very active, and their demand for food very constant. Some of them are adapted for seizing their prey by leaping, others by running, a few by swimming and diving. Most of them can only seize it with their mouths; but some have also, for this purpose, sharp retractile claws.

CAR'NOCHAN, John Murray, b. Georgia, 1817; educated in Edinburgh; studied medicine and surgery with Dr. Mott of New York, beginning practice in 1847. Dr. Carnochan rapidly rose to the first rank among practicing physicians and surgeons, and acquired great celebrity for the boldness and success of his operations, such as the removal of the lower jaw; the cure of elephantiasis by ligature of the femoral artery; excision of the ulna and still preserving the arm with most of its functions; amputating the hip joint; and particularly for removing, in a case of neuralgia, the entire trunk of the second branch of the fifth pair of nerves. He has been professor of the principles and operations of surgery in the New York medical college, and health officer of the port. He has published a number of important papers on medicine and surgery.

CARNOT, Lazare Nicolas Marguerite, b. May 13, 1753, at Nolay, in the department of *Côte d'Or*, Burgundy, gained distinction at an early period by his talents in mathematical science and military engineering. In 1791, he became a member of the legislative assembly, and, in the convention, voted for the death of Louis XVI. After taking the command of the army of the north, and gaining the victory of Wattignies, he was elected into the committee of public safety, in which he was intrusted with the chief direction of military affairs, and greatly contributed to the successes of the French army. Though he endeavored to restrict the power of Robespierre, he was accused, with others, after the reign of terror; but the charge was dismissed. In 1797, having opposed the extreme measures of Barras, his colleague in the directory, C., as a suspected royalist, was sentenced to deportation. He escaped into Germany, where he wrote his defense, which conduced to the overthrow of his colleagues in 1799. The 18th Brumaire brought him back to Paris, where he was made minister of war, 1800; and by his energy, skill, and fertility of administrative resource, helped to achieve the brilliant results of the Italian and Rhenish campaigns. He retired, however, from his office when he understood the ambitious plans of the emperor, but hastened, when he witnessed the reverses of the empire, to offer his services to Napoleon, who gave him the command of Antwerp in 1814, which he heroically defended. During the hundred days, he held office as minister of the interior; and after the second restoration, retired first to Warsaw, and next to Magdeburg, where he died, Aug. 2, 1823. Among C.'s numerous writings on mathematics and military tactics, etc., we may notice his *Essai sur les Machines en Général* (1786); *Réflexions sur la Métaphysique du Calcul Infinitésimal* (1797); and the *Géométrie de Position* (1813).—His son, Lazare Hippolyte Carnot, b. at St. Omer, April 6, 1801, one of the leaders of the French democracy, was in early life a disciple of St. Simon, but, like others, left that school on account of the lax morals advocated by Enfantin—protesting against "the organization of adultery"—and devoted himself to the inculcation of a more orthodox and virtuous socialism in various periodicals. In 1847, he declared himself a republican in his brochure, *Les Radicaux et la Charte;* and, after the Feb. revolution, was appointed minister of public instruction, but not finding himself in sufficient *rapport* with his colleagues, he resigned. In 1863, he entered the corps législatif, and the national assembly in 1871. He has written an *Exposé* of St. Simonianism and *Mémoires* of Henri Gregoire and of Barrère.

CARNUNTUM, an ancient t. in upper Pannonia, on the Danube, founded by the Celts, but at an early period a Roman post. Marcus Aurelius resided here for three years during his wars with the Marcomanni. In the 4th c. C. was destroyed by German invaders; it was afterward rebuilt, and finally destroyed in the Magyar wars of the middle ages.

CA'ROB, Al'garoba, or Locust-tree, *Ceratonia siliqua,* a tree of the natural order *leguminosæ,* suborder *cæsalpinieæ,* a native of the countries around the Mediterranean sea, in size and manner of growth much resembling the apple-tree, but with abruptly pinnate dark evergreen leaves, which have about two or three pair of large oval leaflets. The flowers are destitute of corolla; the fruit is a brown leathery pod, 4 to 8 in. long, a



CARNIVORA.—1. Lion. 2. Lioness. 3. Lion's skull. 4 Tiger. 5. Jaguar. 6. Leopard. 7. Serval. 8. Cat's skull. 10. Lynx. 11. Skull of lynx. 12. Spotted hyena. 13. Skull of hyena. 14. Gepard (leopard trained to hunt).

little curved, and containing a fleshy and at last spongy and mealy pulp, of an agreeable sweet taste, in which lie a number of shining brown seeds, somewhat resembling small flattened beans. The seeds are bitter and of no use, but the sweet pulp renders the pods an important article of food to the poorer classes of the countries in which the tree grows. They are very much used by the Moors and Arabs. They are also valuable as food for horses, for which they are much employed in the s. of Europe, and have of late years begun to be extensively imported into Britain, under the name of *locust beans*, which name and that of *St. John's bread* they have received in consequence of an ancient opinion or tradition, that they are the "locusts" which formed the food of John the Baptist in the wilderness. It seems probable that they are the "husks" (*keration*) of the parable of the Prodigal son.—The Arabs make of the pulp of the C. a preserve like tamarinds, which is gently aperient.—The C. tree is too tender for the climate of Britain. Dr. Royle thinks its introduction into the n. of India would be an important addition to the resources of that country, and a valuable safeguard against famine. The produce is extremely abundant, some trees yielding as much as 800 or 900 lbs. of pods. The wood is hard, and much valued, and the bark and leaves are used for tanning.—The locust tree (q.v.) of America is quite distinct from this.

CAROL, a Christmas hymn that may be traced to the primitive church. It was customary to call upon such as could sing to praise God in a hymn, either out of the Scriptures or of their own invention; and it was also customary for bishops on Christmas day to make sport with their clergy, and to sing; which custom was in imitation of the *Gloria in Excelsis* of the angels. See CHRISTMAS CAROL, *ante*.

CAR'OLAN, or O'CAROLAN, TURLOGH, 1670–1738; one of the most noted of native Irish bards. When but 18 years old he became utterly blind, and thenceforward followed the profession of wandering minstrel, in which character he won great fame. The number of his compositions, to the greater part of which he fitted words, was about 200.

CAROLINA, NORTH, an Atlantic state of the American union, having South Carolina and Georgia on the s., Tennessee on the w., and Virginia on the n.; in lat. 33° 53′ to 36° 33′ n., and long. 75° 25′ to 84° 30′ w., being about 450 m. long, and about 180 broad, with an area of about 50,704 sq. miles. The census of 1870 gave 678,470 whites, 391,650 negroes, and 1241 civilized Indians—1,071,361 in all. North Carolina was restored to a place in the union in 1868, after a new constitution had been adopted by the state government, and approved by congress. It sends 8 members to the lower house of congress, returning also, in common with every other state, 2 senators to the upper. The public debt of North C., in 1874, was 38,921,848 dollars, and its valuation of property was 143,723,813 dollars. Annual expenses of government, 1,400,000 dollars. Of railways, there were, in the year 1875, in actual operation, 1346 miles. The principal rivers are the Chowan, Roanoke, Tar, Neuse, and Cape Fear. Of these, the first four divide themselves equally between Albemarle and Pamlico sounds—inlets which, besides being shallow and difficult in themselves, are almost entirely cut off from the sea by a nearly continuous series of low islands—and the last of the five, though it does fall into the open ocean, is yet not materially superior to the others, never showing more than 14 ft. of water on the bar. With this insular breast-work, the mainland is geologically connected to a depth of about 60 m., being everywhere alluvial, and in many places swampy. To the w. of this belt, the country, after undulating into hills, is traversed by the ridges of the Alleghanies, which, culminating in Mt. Mitchell to an elevation of 6470 ft., bear aloft between them a table-land of fully one third of that altitude. Through the maritime tract, and even beyond it, the rivers are generally practicable for steam-boats. Among the productions, the most characteristic is the pitch-pine of the lower level; so that, in the matter of naval stores, this state surpasses all the rest of the union taken together. In mineral resources, also, North C. takes a lead, more especially in gold, copper, iron, and coal. The value of the manufactured products of North C. in 1870 was 19,021,327 dollars; the value of the cotton brought to its shipping ports in 1876 was £1,122,959. The chief towns are Raleigh, the capital, near the Neuse; Wilmington and Fayetteville on the Cape Fear (the former within reach of tide-water, and the latter at the head of the navigation); New Berne, and Charlotte. North C. was first permanently colonized from Virginia in 1653. Down to 1693, it continued to form one province along with South Carolina, the two being frequently still called the Carolinas. In a local declaration of independence of May, 1775, 14 months before the 4th of July, 1776, North C. first demanded a separation from Great Britain. See NORTH CAROLINA.

CAROLINA, SOUTH, an Atlantic state of the American union, of a triangular form, with North Carolina and Georgia on its inland sides. It extends between 32° and 35° 10′ n. lat., and 78° 25′ and 83° 20′ w. long., having an area of 34,000 sq. miles. In 1870, the total pop. of South C. was 705,606; of whom 289,667 were whites, 415,814 negroes, and 124 civilized Indians; in 1875, the population was 923,447. The total population in 1800 was 345,591. South C. formerly differed from all the other states in appointing its presidential electors, and its executive, not by the popular suffrage, but by the joint vote of the two branches of the local legislature, being thus pre-eminent in the aristocracy of its constitution. In 1868, however, in the reconstruction of the southern states, South C. was restored to a place in the union, with a new constitution adopted by a majority of voters, and approved by congress. It is represented in congress by 5 members in the

lower house, besides the 2 senators which each state possesses alike. Physically a continuation of its northern neighbor, South C., behind a breast-work of islets, presents a low belt, generally swampy, of about 100 m. in depth, rising backward through an undulating region to a height of 4000 ft. in the Alleghanies. With such a range of soil and climate, the productions are very various—cotton, rice, tobacco, indigo, sugar, silk, maize, and wheat. In the first two articles, South C. stands pre-eminent, yielding nearly as much rice as all the other states together, and more cotton, in proportion to area, than any other state. Its mineral treasures are chiefly granite, sienite, marble, and gneiss, from the primitive formations of the state, for building; along with gold, lead, and iron: it is probable that no coal will be found. The public indebtedness of South C. in 1874 was 17,017,651 dollars, and the assessed value of property in 1873 was 176,956,502 dollars. Since the reconstruction of the state, public institutions have made great progress. With not much more than 50 m. of canal, South C. has 1400 of railway. The chief rivers, each the receptacle of considerable affluents, are the Great Pedee, Santee, and Edisto, and also the Savannah, as common to Georgia and South C., the whole being said to furnish an inland navigation of 2400 miles. The cotton product of South C. in 1866 amounted to 112,273 bales; in 1868, to 240,225; and in 1873–74, to 438,194 bales. The value of the cotton brought to the shipping ports of South C. in 1876 was £4,320,568. See South Carolina.

CAROLINA PINK. See Spigelia.

CAROLINA, Maria, 1752–1814; daughter of Francis I. and Maria Theresa of Austria, and queen of Naples by her marriage with Ferdinand IV. in 1768. She had great influence with the king, leading him in 1798 to declare war against France, the consequence of which was the marching of the French upon Naples and the flight of Ferdinand and Carolina to British protection. After returning to Naples she conspired against Napoleon, and, with her husband, was again expelled. She died in Vienna before any further restoration to the throne.

CAROLINE, a co. in e. Maryland, on the Delaware border, intersected by the Maryland and Delaware and the Dorchester and Delaware railroads; 300 sq.m.; pop. '80, 13,767—4166 colored. It has a level sandy surface, producing corn, oats, potatoes, etc. Co. seat, Denton.

CAROLINE, a co. in e. Virginia, on the Rappahanock river, and the Richmond, Frederick and Potomac railroad; 480 sq.m.; pop. '80, 17,243—9637 colored. Productions, wheat, corn, oats, and tobacco. Co. seat, Bowling Green.

CAROLINE, Amelia Elizabeth, wife of George IV. of Great Britain, was the second daughter of Charles William Ferdinand, duke of Brunswick Wolfenbüttel, and of the princess Augusta of Britain. She was born on the 17th May, 1768, and spent her youth under great restraint at her father's court. In 1795, she was married to the prince of Wales. The marriage was disagreeable to him, and although she bare him a daughter, the princess Charlotte, he separated from her immediately on her recovery from childbed; and she lived by herself in a country residence at Blackheath, the object of much sympathy, the people regarding her as the victim of her husband's love of vice. Reports to her discredit led the king, in 1808, to cause investigation to be made into her conduct, which was found to be imprudent, but not criminal. In 1814, she obtained leave to visit Brunswick, and afterwards to make a further tour. She visited the coasts of the Mediterranean, and lived for some time on the lake of Como, an Italian, by name Bergami, being all the while in her company. When her husband ascended the throne in 1820, she was offered an annuity of £50,000 sterling to renounce the title of queen, and live abroad; but she refused, and made a triumphal entry into London, whereupon the government instituted proceedings against her for adultery. Much that was very offensive was proved as to her conduct; but the manner in which she had been used by her husband, and the splendid defense of Brougham, caused such a general feeling in her favor, that the ministry were obliged to give up the divorce bill, after it had passed the house of lords. She now fully assumed the rank of royalty, but was refused coronation, and turned away from the door of Westminster abbey on the day of the coronation of her husband. She died on 7th Aug., 1821.

CAROLINE BOOKS, four works drawn up at the request of Charlemagne against the decrees of the second council of Nice on the adoration of images, and contained in the *Capitulare Prolixium* of Charlemagne,

CAROLINE ISLANDS, or NEW PHILIPPINES, a widely scattered archipelago in the Pacific, n. of New Guinea and e. of the Philippines, between 3° and 11° n., and 135° and 137° e. The westernmost are known as the Pelew (q.v. *ante*) or Palau islands, and cover 346 sq.m. of land, being nearly encircled by a coral reef. The surface is well wooded, and the soil fertile, producing bread-fruit, cocoa-nuts, sugar-cane, oranges, bananas, etc., in abundance. Cattle, sheep, and hogs have been domesticated; there is a great variety of birds, and the lagoons abound with fish. The inhabitants are dark-colored, and evidently of Papuan and Malay blood. The islands, and most of the villages, form independent but co-operative republics. One of the most remarkable institutions is the "clöbbergall," a kind of union for mutual aid and defense. The women, too, have clöbbergalls of their own, and exercise much political influence. Up to the

close of the last century the people used stone instruments and weapons. Their currency consists of pieces, or pieds, of ancient glass and enamel, to which they ascribe a divine origin. The population, supposed to be about 10,000, seems to be decreasing. The central islands, or Carolines proper, consist of 48 groups, and comprise between 400 and 500 islands, of about 360 sq.m. in all. The Matelotas group lies n.e. of the Pelews, and consists of three islands, thinly inhabited. Yap, or Guap, further n.e., is 10 m. long, and has a good harbor. The natives of Yap are more advanced in civilization than their neighbors; they cultivate the betel-nut with great care, build good boats, lay out regular villages, pave the streets, and build stone piers and wharves. A Spanish mission was established in 1856. The Ulea, Swede, and Lutke islands are unimportant; but the Hugoleu (or Rug) group, discovered in 1824, consists of five large and about 40 small islands, with 35,000 inhabitants of two races, red and black, who are often at war with each other. The Mortlack, or Young William's, group consists of three islands, with a population of about 3,400, of Samoan origin, who are the only idol-worshipers in all the archipelago. To the n.e. lies Ruven island, inhabited by immigrants of mixed foreign blood. The Seniavine group, comprising three islands, has a small colony of whites, and one of the islands has been the seat of an American mission since 1851. This island, called Ascencion by the French, is a rendezvous for whaling vessels. In the center is a remarkable pile of ruins which seem to have belonged to a fortification. Strong's island, in the center of the Carolines proper, is a volcanic upheaval, discovered by Crozier in 1804, and is now the seat of an American mission. The eastern Carolines, otherwise the Mulgrave archipelago, comprise the Radak or Marshall group, and have a population estimated at 100,000. See POLYNESIA, *ante.*

CAROLINE MATILDA, 1751–75; sister of George III. of England; queen of Denmark, having married Christian VII. in 1768, by whom she became the mother of Frederick VI. Through the jealousy of the queen dowager and the king's step-mother, she was accused of infidelity, and the king, who had become weak-minded, if not idiotic, caused her and Struensee, her physician, to be arrested. The interference of the British minister saved the queen from death, but she was sent into Hanover, where she died of grief in the castle of Celle. See STRUENSEE, *ante.*

CARON, RENÉ ÉDOUARD, b. Canada, 1800; educated in the Quebec seminary; admitted to the bar in 1826. He was mayor of Quebec 1827–37, and speaker of the legislative council 1843–47, and 1848–53; when he abandoned political life, and was appointed judge of the queen's bench. In 1857 he was commissioner for codifying the laws of Lower Canada, and in 1873 was appointed lieutenant-governor of Quebec.

CAROLUS-DURAN, ÉMILE AUGUSTE. See page 890.

CARO'RA, a t. of Venezuela, South America, in the province of Caro, 210 m. w.s.w. of Caracas, and 60 m. e. of lake Maracaybo, on the Tocuyo. The town is well built, has a handsome parish church, convent, hermitage, etc. There are manufactures of leather, ropes, and fine hammocks from the fiber of the *agave fœtida.* A trade is carried on in agricultural produce, and in the aromatic balsams, resins, gums, and wild cochineal for which the district is famous. The pop., which was formerly much larger, is now about 6,000.

CAROT'ID ARTERY. The great artery which on each side distributes blood to the different parts of the head, appears to have derived its name either from Gr. *kara,* the head, or, more probably, from Gr. *karos,* sleep, there being an old idea, which the researches of Dr. Alexander Fleming have shown to be correct, that there was some connection between deep sleep and compression of these vessels.

Each C. A. consists of the primitive or common carotid, which, at the upper margin of the larynx or organ of voice, separates into two great divisions, of nearly equal size—the external and the internal carotid. The external carotid supplies the larynx, tongue, face, and scalp with blood; its principal branches being the superior thyroid, the lingual, the facial, the occipital, the posterior aural, the internal maxillary, and the temporal. The last-named artery is occasionally opened by the surgeon in preference to a vein, as, for example, in certain cases of cerebral apoplexy. The internal carotid enters the cavity of the cranium through a somewhat tortuous canal in the temporal bone, and after perforating the dura mater, or fibrous membrane of the brain, separates into the anterior and middle cerebral arteries, which are the principal arteries of the brain; while in its course through the dura mater, it gives off the ophthalmic artery, which subdivides into several small branches that supply the eye and surrounding parts. See CIRCULATION.

Surgery.—Wounds of the carotid trunks are generally from stabs. Suicides have a vague desire to cut them, but rarely cut sufficiently deep by the side of the windpipe. Of course, should either vessel be wounded, death results almost immediately. Punctured wounds, however, may not be immediately fatal; they may heal, or a false aneurism (q.v.) may result. Such an occurrence happened about twenty years ago in Scotland. A young man was stabbed close to the root of the neck; a pulsating tumor formed, which rapidly increased, and would undoubtedly have burst before long, had not prof. Syme of Edinburgh cut into it, and, by an operation requiring extraordinary courage and dexterity, tied the common C. A. above and below the part stabbed; thereby saving

not only the life of the patient, but that of the man who had inflicted the wound, and who was then in prison awaiting his trial.

Sir Astley Cooper was the first to tie the common carotid for spontaneous aneurism, in Nov., 1805; and since then, the operation has been successfully performed in a number of cases. Owing to the numerous interchange of branches between vessels of both sides of the head, cutting off the supply of blood through one carotid is seldom followed by affections of the brain. Such have, however, occurred in a few instances; but Dr. Mussey of America tied both carotids within twelve days of each other without any such result.

The common carotid in the horse is the termination of the right arteria innominata. It is a large vessel, about an inch long, which emerges from the chest below the windpipe, and divides into the *right* and *left* carotids. These bend upward, having the windpipe between them, gradually inclining inwards at the upper part, where each divides into external and internal carotid, and a large anastomosing branch arising from between these two.

CAROUGE, a t. of Switzerland, canton of Geneva, about 2 m. from the city of that name, with which it is connected by a bridge across the Arve. It has cotton-spinning, leather, and pottery manufactures; and in 1780 the king of Sardinia, as ruler of Savoy, tried to set it up as the industrial rival of Geneva, but failed. Pop. '80, 5,889.

CAROUGE, a t. of Switzerland, in the canton and about one m. s. of Geneva, on the left bank of the Arve. It is beautifully situated, regularly built, and surrounded by villas, orchards, and meadows. It has a handsome Roman Catholic and a Protestant church. There are manufactures of thread, clay pipes, leather, watches, and pottery. There is a bridge across the Arve connecting the town with Geneva. Pop. '70, 5,871. [From Suppt.]

CARP, *Cyprinus carpio*, a fish of the family *Cyprinidæ* (q.v.), of which, indeed, it may be regarded as the type, a native of the central countries of Europe, and corresponding latitudes in Asia, but on account of its value as an article of food, long naturalized in many countries in which it is not indigenous. No fish, indeed, except its congener the goldfish, has been so much transported by man from one place to another; and this has been the more easily and successfully accomplished, that the C. can subsist longer than most fishes out of the water, if only kept moist. The C. is said not to be originally a native of England, but the statements sometimes made as to the time of its introduction are untrustworthy; it certainly existed in England before the 16th century. It is mentioned in the famous Boke of St. Albans, in 1496, by Dame Juliana Barnes, as a "dayntous fysshe, but scarce." The C. spawns in May, and is out of condition until July. It does not succeed so well in Scotland, of which country it is certainly not a native, as in the s. of England; and in northern countries generally, it neither increases so rapidly in size, nor exhibits so great fecundity, as in more congenial climates. Its fecundity, in favorable circumstances, is prodigious; more than 700,000 eggs have been found in the ovaries of a single C. of moderate size. The C. is rather an inhabitant of lakes and ponds than of rivers, in which, if it is found, it shows a preference for the stillest parts. It feeds chiefly on aquatic plants, and may be fattened on lettuces and similar soft vegetables, for which its teeth are remarkably adapted, being few, mostly large, flat, and situated on the pharynx very far back in the mouth; worms, mollusks, and insects, however, form part of its food. It deposits its spawn on weeds. It is said to live to a great age, even 150 or 200 years; its scales, "like the productions of the cuticle in some other animals, becoming gray and white with age." It is known to attain the weight of 3 lbs. when six years old. A C. of 18 or 19 lbs. weight is deemed of extraordinary size in England, but one of 70 lbs. weight, and nearly 9 ft. long, was taken near Frankfort-on-the-Oder, and 30 or 40 lbs. is not an unusual size in some of the German lakes. In Austria and Prussia, many lakes and ponds are let at a high rent for the C. which they contain.—Of the other species of the genus *cyprinus*, as now restricted, which are found in Britain, none belong to the section having barbules at the angles of the mouth. See CRUCIAN, GIBEL, and GOLDFISH.

To the angler, the C. is not a very valuable fish, as he is by no means a free biter. When hooked, however, he runs strongly, and fights with considerable determination and cunning. In still water, the best means of fishing for C. is with a very light quill-float. A small piece of dead rush will answer the purpose equally well, or better. The float should be fixed on the line so that the bait may be *upon* the bottom, and if that be clear of weeds (the angler must take care that it is so), the C. will easily see and pick up the bait. It is advisable, however, in fishing for C. to use two rods, and the float to one of these should be so placed that the bait may be just *off* the bottom. The former tackle should be baited with well-scoured red worms, gentles, or grubs of some sort; the latter with a green pea, boiled wheat, or paste. The hooks should be of No. 8 size, and tolerably stout in the wire, and the gut perfectly round and good, and as fine as is consistent with the size of the fish angled for. In using green peas or wheat, boil until the skin cracks. Very small potatoes of the size of a bean have been known to attract good carp. The best paste is bread worked up with a little brandy or gin. Gentles, wasp grubs, flies, and other insects, worms, or caterpillars, may all, at times, take carp. When a C. bites, he nibbles at the bait for

some seconds before he takes it, and often takes off the tail of the worm, or strips the hook completely. But it is quite useless to strike until the float disappears entirely.

CARPÆ'A, a dance in ancient Thessaly; a pantomime represented by two men, one a robber and the other a plowman, in which there was a contest for the possession of the plowman's oxen, which are finally captured by the robber. All the action was rhythmical, and performed much like a pantomime of the present day.

CARPA'THIAN MOUNTAINS, the mountains which inclose Hungary and Transylvania on the n., e., and s. in a great semicircle (whose concavity is towards the s.w.), extending over a space of 800 m. from Presburg on the Danube to Orsova on the same river, between lat. 44° 30′ to 49° 40′ n., long. 17° to 26° east. The C. M. form part of the great mountain system of central Europe, separated from the mountains of Silesia and Moravia by the valley of the March, and from the Alps and Mt. Hæmus by the valley of the Danube. Almost the whole of the C. M. lie within the Austrian dominions. They form two great masses, one in Hungary to the n.w., and one in Transylvania to the s.e., with ranges of lower and wooded mountains between. The highest group of the Hungarian Carpathians is thatof *Tatra* or the *Carpat*, in the very n. of Hungary, a majestic mass of granite mountains, exhibiting much grandeur in its naked precipices, and in some of its peaks rising to the height of more than 8,900 ft., the Lomnitz peak being 8,133 ft. high. On the northern declivity of the Eisthal peak exists the only glacier in the Carpathians. The Tatra group is penetrated by no valleys, but only by wild ravines, and is separated from the rest of the range by deep depressions. There is a great difference of climate between its southern and northern sides. These higher mountains yield few minerals, but the lower Carpathians of Hungary, which stretch around them in groups and ranges, abound in minerals of various kinds. The mines of Schemnitz (q.v.) are of great celebrity. Many of the Hungarian mountains are of limestone. The mountains of Transylvania are mostly of primitive rocks. On the eastern and southern borders, they reach the height of 9,000 ft. and upwards. Mt. Butschetje, the culminating peak, has an elevation of 9,528 ft. above the sea. The C. M. are generally clothed with wood to a height of more than 4,000 ft.—in some parts, forests are found at 5,500 ft.—and with steep precipices, narrow ravines, extinct craters, and cones of volcanic origin, they exhibit scenes of grandeur rarely exceeded. The lower parts of the mountains are beautifully clothed with vineyards, walnut groves, etc., above which ascend forests of cherry, beech, and pine. The ranges which connect the high mountains of Hungary with those of Transylvania are in great part composed of sandstone, have an unfruitful soil, and comparatively little population or cultivation.

CAR'PATHOS. See SCARPANTO, *ante*.

CARPEAUX, JEAN BAPTISTE, 1827–75; a French sculptor, whose more conspicuous works are "The Fisher Boy," "Ugolino and his Children," "Neapolitan Fisherman," "Girl with a Shell," "France enlightening the World, and protecting Agriculture and Science," and the noted group, "La Danse," on the façade of the Paris opera-house.

CARPEL (Gr. *karpos*, fruit), in botany, a modified leaf forming the whole or part of the pistil of a flower. The number of ovaries and stigmas in the pistil depends on the number of carpels of which it is composed, but sometimes several are so intimately united that they appear as one. It is the upper surface of the leaf which forms the inner surface of the carpel. At its margins, the ovules are developed, like the buds formed on true leaves of some kinds of plants. The fruit, as well as the pistil, may therefore be said to be composed of one or more carpels.

CARPENTA'RIA, GULF OF, a broad and deep indentation of the n. coast of Australia, stretching from 11° to 17° 30′ s. lat., and from 136° to 142° e. longitude. It is said to have been named from Carpenter, a Dutchman, who discovered and partly explored it in 1627. The gulf of C. contains many islands. The shores of the mainland are generally low; and, in the rainy season, the floods are such as materially to freshen the sea.

CARPENTER, FRANCIS B., b. 1830; a painter whose portrait of Lincoln, and "Emancipation Proclamation," have gained some celebrity. He published *Six Months in the White House*.

CARPENTER, LANT, LL.D., 1780–1840; an English Unitarian minister, successor of Dr. Kenrick at Exeter; afterwards in charge of a church in Bristol. He was much interested in the religious instruction of children, and established several Sunday-schools. Among his works are *An Introduction to the Geography of the New Testament; Unitarianism the Doctrine of the Gospel; Examination of the Charges against Unitarianism;* and *Harmony of the Gospels*.

CARPENTER, MARY, daughter of the Rev. Dr. Lant Carpenter, of Bristol, and sister of Dr. William Carpenter (b. 1807, d. 1877). She took an active part in the movement for the reformation of neglected children, and besides advocating their cause in her writings, she founded several reformatories for girls, one of which, the Redhedge reformatory, she superintended. In the prosecution of her philanthropic labors she visited India three times, and, in 1871, instituted the national Indian association, whose journal

she edited. Besides her reformatory writings, she published *Our Convicts* (1864), a book which drew public attention to the treatment of young criminals; *The Last Days of the Rajah Rammohun Roy;* and *Six Months in India.*

CARPENTER, Matthew H., b. Vt., 1824; studied law with Rufus Choate; and in 1848 settled in Wisconsin, from which state he was returned as U. S. senator in 1868, and was re-elected in 1879. C. was an able lawyer and a brilliant debater. He d. 1881.

***CARPENTER,** William Benjamin, M.D., LL.D., F.R.S., F.L.S., F.G.S., one of the most distinguished physiologists and writers on physiology of the present day. Soon after his graduation in Edinburgh in 1839, he published his *Principles of General and Comparative Physiology,* which was one of the earliest works giving a general view of the science of life. As the treatise grew in size in successive editions, it was divided into two—*The Principles of Comparative Physiology,* and *The Principles of General Physiology.* These works, together with *The Principles of Human Physiology,* which originally appeared in 1846, and reached a fourth edition in 1853, and *The Principles of Mental Physiology* (Lond. 1874), form a perfect cyclopædia of biological science. C. has likewise published *A Manual of Physiology; The Microscope, its Revelations and its Uses;* a prize essay upon *The Use and Abuse of Alcoholic Liquors;* and numerous memoirs on various departments of physiology, microscopical anatomy, and natural history, in the *Philosophical Transactions,* etc. His most important original researches are *On the Structure of Shells; On the Development of Purpura Lapillus;* and *On the Structure, Functions, and General History of the Foraminifera.* For several years he edited *The British and Foreign Medico-Chirurgical Review,* and he was one of the editors of *The Natural History Review.* In 1848, he was appointed professor of medical jurisprudence at university college, and soon afterwards examiner in physiology and comparative anatomy in the university of London; but he resigned these offices on his appointment, in 1856, as registrar to that university. In 1861, the royal medal was awarded to him by the royal society; and in 1873, he was elected a corresponding member of the institute of France. He took a chief part in the government expeditions sent out in 1868–69–70 for deep-sea exploration in the n. Atlantic; and since then he has contributed largely to the discussion of the vexed question of ocean circulation in the journal of the royal geographical society and other periodicals. In the art. Atlantic in the *Ency. Brit.,* 9th ed., his views will be found summarized. He advocates the doctrine of a *vertical circulation* sustained by opposition of temperature only, independent of and distinct from the *horizontal* currents produced by winds; see Gulf Stream. This doctrine was first advanced by prof. Lenz of St. Petersburg in 1845; but Dr. C. was ignorant of this, when the deep-sea observations begun in 1868 led him to an identical theory. Dr. C. has written largely on another controverted subject—that of spiritualism, which he maintains to be a delusion. He entered this field as early as 1853, in an article on animal magnetism in the *Quarterly Review;* a late contribution to the controversy is *Mesmerism, Spiritualism, etc., historically and scientifically considered* (Longmans & Co., 1877).
See *Supp.,* page 890.

CARPENTER BEE, a name given to those bees that excavate their nests in wood. One of these, *xylocopa violacea,* has been already noticed, and its nest briefly described, in the article Bee (q.v.).

CARPENTER, SHIP'S, a naval officer whose duty is to keep a ship of war in repair, specially during action in case of damage that may endanger sinking.

CARPENTRAS, a t. of France, in the department of Vaucluse, is situated on the left bank of the Auzon, about 15 m. n.e. of Avignon. This town was known to the Romans as *Carpentoracte,* and among other remains, a triumphal arch attests their former presence here. C. has manufactures of cottons, woolens, and leather; brandy distilleries, dye-works, etc. It is the entrepôt for the products of the district. Pop. '72, 7,857.

CARPENTRY is the art of framing timber for architectural and other purposes. Technically, the term is restricted to the framing of heavy work, such as the roofs, floorings, partitions, and all the wood-work concerned in maintaining the stability of an edifice, while the minor and ornamental fittings are called joinery; but popularly the workman who does either kind of work is called a carpenter.

The present article will be confined to a popular description of the most useful methods of framing timber and smaller wood-work.

The preliminary preparation of timber is the work of the sawyer, who, by the saw-mill or pit-saw, divides the trunks of trees into planks, etc.; these are further divided by the carpenter, who uses hand-saws of various kinds, according to the work. For dividing wood into separate pieces in the direction of the fiber, the *ripping-saw* is used; for cross cutting, or sawing thin pieces in the direction of their length, the common *hand-saw* or the finer toothed *panel-saw;* for making an incision of a given depth, and for cutting small pieces across the fiber, the *tenon-saw,* the *sash-saw,* or *dovetail-saw* is used. These are thin saws, stiffened by a strong piece of metal at the back to prevent crippling. When a curved cut is to be made, a very narrow saw without a back, called a *compass-saw* or a *heyhole-saw,* is used. The general name for these is *turning-saws;* they have their plates thin and narrow towards the bottom, and each succeeding tooth finer, and the teeth are not bent on contrary sides of the plate for clearing, as in broad saws.

The surface of wood is smoothed by planing. According to the work, different kinds of planes are used: the *jack-plane*, which is large and rough, for taking away the rough of the saw; the *trying-plane*, for bringing the surface perfectly level and true, or the *long-plane* for the same purpose, where the work is of great length, as for the joining edges of long boards to be glued together. The *smoothing-plane*, which is much smaller than these, gives the smooth finished surface. The *spoke-shave*, a sort of plane with a double handle, is used for paring and smoothing rounded work.

Ornamental moldings are cut by means of molding-planes, which have their cutting edges curved to the required pattern. A good stock of these is one of the most expensive items of the tool-chest.

The paring of wood, and the cutting of rectangular or prismatic cavities, notches, etc., are done by means of *chisels*. Those for cutting across the fiber are called *firmers* or *paring-chisels;* those for cutting deep and narrow cavities, *mortise-chisels*, which are made very thick and narrow, and fitted in the handles with a strong flange, to bear heavy blows with the mallet. Chisels for paring concave surfaces are called *gouges*. For boring holes, *brad-awls*, *gimlets*, *centerbits*, and *gouges* are used—the two latter are fixed in a *stock* or revolving handle, and are used for large holes. When it is required to ascertain if an angle be square, or of any given inclination, the *square*, or the *bevel* set to the required angle, is applied to test the work as it proceeds. When parallel edges are required, the *marking gauge* is used to draw the line to be worked to. When a simple straight line is required for working to, a piece of string is chalked, then stretched tightly over the wood and lifted in the middle, when, by its recoil, it strikes the wood and leaves a straight chalked line. The *straight-edge*, a strip of wood with one of its edges perfectly straight, is applied to detect superficial irregularities. The operation of planing the edge of a board straight is called *shooting*, and such edges are said to be *shot*. When the joiner requires to ascertain whether the surface of a piece of wood is all in one plane, he takes two slips of wood with edges perfectly straight and parallel, and of equal width; these slips, called *winding-sticks*, are placed edge upwards, one at each end, across the board, and the workman looks in the longitudinal direction of the board over the upper edges, and if the two edges be not in the same plane, the board is planed down at the elevated parts until it is *out of wind*. For setting work level, a spirit-level, set in a wooden frame, or a plumb-level is used. For further description of the tools alluded to above, and in the rest of this article, see the special articles.

When two pieces of timber have to be united at their ends, as in lengthening the beams for roofing, partitions, the masts and keels of ships, etc., the operation is called *scarfing*, and the joint a *scarf*. The methods of scarfing are very numerous; those figured below will serve to illustrate the principal.

The following are the principal rules for scarfing as stated by Tredgold.

The length of the scarf should be, if bolts are not used—in oak, ash, or elm, six times the depth of the beam; in fir, 12 times the depth of the beam. If bolts and indents are combined, the length of the scarf should be—in oak, ash, or elm, twice the depth of the beam; in fir, four times the depth. In scarfing beams to resist transverse strains, straps driven on tight are better than bolts. The sum of the areas of the bolts should not be less than one fifth the area of the beam, when a longitudinal strain is to be borne. No joint should be used in which shrinking or expansion can tend to tear the timbers. No joint can be made so strong as the timber itself. When two pieces of timber are connected so that the joint runs parallel with the fibers of both, it is called a *longitudinal joint;* but when the place of the joint is at right angles to the fibers of both, an *abutting joint*. A very short tenon is called a *stub tenon*. When a second minor tenon is made projecting from the principal tenon, it is called a *tusk tenon*.

For lighter joiner's work, other methods of framing are used, and adapted to the work—to boards generally instead of beams; thus, for example, the mortise and tenon joint, made oblong instead of square, is used in framing doors, shutters, drawing-boards, or any other kind of extended superficial work liable to warping. An outside frame or skeleton is made with a panel or panels in the middle, and each piece of the frame has the grain at right angles to the piece into which it is mortised, in order that they shall eventually correct the warping.

Dovetailing is extensively used for connecting boards at right or other angles, as in making boxes, drawers, etc. Common dovetailing is usually glued. Nails or pins and glue are used with the miter and other notched joints.

Boards may be united at their edges to form an extended surface, as a flat plank partition, etc., either by simple gluing of the shot edges, by a *rebate*, or by a plowed groove and a corresponding projection. The rebate is cut by means of a rebating plane; that in the figure is combined with a bead, the usual joint for wooden partitions. The groove, a sort of extended mortise, is cut by a plane with a projecting iron called the *plow*.

In all cases where glue is used in joints, it should be applied to both surfaces, which should be rubbed and pressed together until nearly all the glue is forced out, then kept pressed by a cramp or weights. White lead is used for outside joints.

Special departments of this subject, such as roofs, staircases, etc., will be treated under their respective heads.

CARPET-BAGGER, a term of contempt applied by the people of the southern United States to a man who came from any other part of the union to live in the south, or to transact business there after the close of the rebellion. The term has been extended so as to designate any person in any part of the country who has no fixed residence. One offense of the carpet-bagger in the south was in teaching negroes to read and write, and helping them to assert their new political rights, which the greater majority of native whites were in no hurry to see exercised. In the unsettled condition of the southern states after the rebellion, they furnished an inviting field for adventurers and demagogues, who gave some ground for the stigma which has largely attached to the name of carpet-bagger.

CARPETS. Woven C., such as are now so common in this country, were first used in the east, where the custom of sitting cross-legged on the floor still renders them especially useful. Our rude forefathers covered the floors of their houses with rushes, hair, or straw; and in Norwegian farm-houses, where so many of our ancient customs still exist, the floor of the best room is commonly strewed with juniper-twigs. The first step towards a woven carpet was made by plaiting rushes to form a matting.

The principal varieties of C. now in use are the Turkey, the Axminster, the Brussels, the Wilton, the Venetian, the Dutch, the Kidderminster or Scotch, Whytock's tapestry and velvet pile, and the printed felt carpet.

The real Turkey carpet is made in one piece; those manufactured for the orientals are usually too small for use in this country. The patterns consist merely of curved and angular strips, of variegated but dark and unobtrusive colors. The warp is of strong linen or cotton, to which bunches or tufts of colored worsted are tied according to the pattern, a drawing of which is placed before the weaver to copy. The surface is afterwards shorn level. Rugs are made in a similar manner; the colored worsteds are tied very rapidly by young girls.

The *Axminster carpet* is merely the English-made Turkey carpet, formerly manufactured as above at Axminster, in Devonshire. They are usually made to order, and of the size required for the room; from the tedious nature of the process of manufacture, they are very expensive.

Templeton's patent Axminster carpet is a very beautiful fabric, very much resembling that from which it derives its name, but it is wrought on the chenille principle.

The *Brussels* carpet is a mixture of linen and worsted, but, like the Turkey carpet, the worsted only is shown on the upper surface. The basis or cloth is a coarse linen fabric, and between the upper and under threads of the weft, several (usually five) worsted threads of different colors are firmly bound in. The pattern is produced by drawing to the surface, between each reticulation of the cloth basis, a portion of the worsted thread of the color required at that spot to produce the pattern; these updrawn portions are formed into loops, by being turned over wires, which are afterwards withdrawn, and the loops thus left standing above the basis form the figured surface of the carpet. The machinery and processes by which this arrangement is produced are rather complex, and require to be seen to be fully understood.

The *Wilton carpet* is made like the Brussels, but the wire has a groove in its upper surface, and instead of being drawn out, it is liberated by passing a sharp knife through the worsted loop into this groove, and thus making a velvet pile surface instead of the looped thread.

The *Venetian carpet* is produced in a common loom, and the pattern is all in the warp, which alone is visible, as it incloses the weft between its upper and under surfaces. The patterns are generally checks or stripes; the latter are chiefly used for stair carpets.

The *Dutch carpet* is a coarser and cheaper variety of plain Venetian, sometimes made wholly of hemp, or of a mixture of coarse wool and cow-hair.

The *Kidderminster* or *Scotch carpet* has usually a worsted warp and woolen weft, and the pattern is made by the combination of the colors of each. Three-ply C. of this kind are made especially in Kilmarnock. This is the most durable of the moderate-priced C.: the patterns are not so brilliant as those of the Brussels or the tapestry, but, being ingrained and woolen throughout, they retain their character until worn through. This, and the three immediately preceding descriptions of carpet, exhibit their patterns nearly similar on both sides, and are therefore reversible.

Whytock's tapestry and velvet pile carpet, as it is now frequently called, is becoming very extensively used as a cheap substitute for Brussels and Wilton, which it is made to resemble very closely in the brilliancy and variety of pattern. The manufacture of this carpet is very curious and ingenious. Instead of five colored yarns, only one of which is drawn to the surface at any one place, while the other four remain buried between the upper and under threads of the cloth basis, a single colored yarn is used, and the variety of color produced by dyeing it of various colors at intervals of its length. The yarn is coiled upon a drum, and printed by means of rollers in such a manner that when the threads that encompass the roller shall be uncoiled and laid in line side by side, they shall present an elongated printing of the pattern, so that a rose, for example, the outline of which should be nearly circular, will be an oval, with length equal to four times its breadth. When, however the thread is looped over the wire,

4 in. of yarn being used for an inch of the carpet pattern, this elongation is exactly compensated, and the rose appears in its proper proportions. The machinery required for this is, of course, much simpler than that for the Brussels, only one yarn having to be looped, and that always in the same manner.

The *printed felt carpets* are, as the name implies, simply made by printing colors on felt. These are chiefly used for bedroom carpets.

A very beautiful fabric has also been introduced, called the *patent wool mosaic*, formed by cementing a velvet pile upon plain cloth. It is used for rugs, etc. The pile is formed by stretching lengths of woolen yarn between plates of finely perforated zinc, placed several yards apart, the colors of the threads being arranged so that their ends shall show the pattern. The mass of yarn is then inclosed in a case, open at both ends, and compressed without deranging the fibers; and by means of a piston or ram at one end, a portion of this mass of yarn is forced forwards, the ends thus projecting are glued to the plain cloth, and when dried, are cut off to the length required for the pile. In this manner, several hundred slices are made from one setting of the yarn mosaic, and as many rugs produced.

CARPI, a t. of northern Italy, 10 m. n. of the city of Modena. It is surrounded by walls, defended by a citadel, has a cathedral, and manufactures of silk and straw hats. Pop. 5,000.—CARPI is also the name of a t. of Venetia, in the province of Verona, 28 m. s.e of Verona, celebrated for the victory obtained here by prince Eugene over the French in 1701. Pop. 1200.

CAR'PI, GIROLAMO DA, 1501–56; an Italian painter who became infatuated with the works of Correggio, and so closely imitated them as to pass off his own as originals. Very probably some of these imitations are now figuring as true Correggios. Da Carpi's best works are the "Descent of the Holy Spirit," "Adoration of the Magi," and the saints Catherine, George, and Jerome, in churches at Rovigi, Bologne, and Ferrara.

CARPINI, JOHANNES DE PLANO, a celebrated Franciscan monk, b. in Capitanata, Naples, about 1210; was one of the six friars selected by pope Innocent IV. to proceed to the court of the emperor of the Mongols, whose warlike advances in 1246 threw Christendom into consternation, in order to pacify the terrible nomadic warriors, and, if possible, convert them to Christianity. The mission, accomplished under dreadful hardships, though without results so far as its main objects were concerned, was nevertheless far from unfruitful. Prior to this, the most monstrous fables had prevailed regarding the Tartars; and C.'s narrative, which gave a truthful and striking picture of their numbers, character, and civilization, was the first to bring these myths into discredit. In this book he also argued, with great good sense, for a union amongst Christian princes, as the only means of resisting those fierce hordes in their progress westward. As a book of travels, its accuracy has been attested by modern travelers. Hakluyt copied most of this work, at second-hand, into his first volume of *Navigations and Discoveries*. The date of C.'s death is not certainly known.

CARPI'NO, a t. of southern Italy, in the province of Foggia, 22 m. n.e. of San Severo, with a pop. of about 6,000.

CARPOC'RATES, or CARPOCRAS, flourished under Hadrian (130 A.D.) at Alexandria, where he founded the Gnostic sect of Carpocratians. According to him, the essence of true religion consisted in the union of the soul with the Monas or highest God, by means of contemplation, which elevated it above the superstitions of the popular faith, and liberated it from the necessity of submitting to the common laws of society. He only is to be reckoned wise who attains to this. Among those who have done so, are Jesus, Pythagoras, Plato, and Aristotle. The cosmogony of C. was of the usual Gnostic character, the central peculiarity of which was the belief that the worlds were created by angels. C. also held the doctrine of the transmigration of souls. His followers existed down to the 6th century. Whether or not they were guilty of the abominations ascribed to them, is more than we can positively affirm; our only information concerning them being derived from *orthodox* writers, who were in the habit of slandering heretics.

CAR'POLITES, a generic term applied to fossil fruits, which, in the present state of our knowledge, it is impossible to refer more precisely to their place in the vegetable kingdom. Of 100 species described, 70 belong to the carboniferous system.

CAR'PUS, CARPAL BONES. See HAND, FOOT, SKELETON.

CARPZOV, a Saxon family descended from Simon Carpzov, burgomaster of Brandenburg about the middle of the 16th century. He left two sons—Benedict and Simon. BENEDICT, 1565–1624, was a jurist and professor of law at Wittenberg; and in 1602, chancellor to Sophia, electress of Saxony. He died at Wittenberg, leaving five sons. JOACHIM, the eldest son of the burgomaster, reached a high position in the Danish army. BENEDICT, the second of the five, 1595–1666, was a professor at Leipsic, ordinary of the faculty of jurists at the same university, and in 1653, privy councilor at Dresden. He published several works which had much influence in the administration of justice. His later years were spent in religious study. AUGUST, 1612–83, his brother and the fourth son of the first Benedict, was distinguished as a diplomatist, was chancellor of the consistory at Coburg, and at the time of his death a privy councilor at Gotha. He was a man of

piety, and the author of several devotional works. JOHANN BENEDICT, 1607–57, fifth son of the first Benedict, was professor of theology at Leipsic, and the author of a system of theology and other works of that nature. He also left five sons, all of whom obtained conspicuous reputation. One of the five was JOHANN GOTLOB, 1679–1767, who became an eminent theologian and professor of oriental languages at Leipsic. He wrote an introduction to the canonical books of the Old Testament, and a *Critica Sacra Veteris Testimenti.* JOHANN BENEDICT, grandson of the first Johann Benedict, 1720–1803, was professor of philosophy at Leipsic, and professor of poetry and Greek at Helmstadt, and professor of theology. He wrote many philological works, and ended his life as an abbot.

CARQUI'NEZ, or KARQUENAS, a strait in California, between Suisun and San Pablo bays, 7 m. long, navigable for steam-boats, and for large vessels as far as Benecia.

CARR, DABNEY, 1744–73; a brother-in-law of Thomas Jefferson, and an eloquent member of the Virginia colonial legislature.

CARR, JOSEPH B. See page 890.

CARR, Sir ROBERT, d. Rhode Island, 1667; one of the English commissioners to New England, appointed by Charles II., the others being Nichols, Maverick, and Cartwright. After the capture of New Amsterdam (New York) from the Dutch in 1664 by Nichols, C. compelled the Dutch and Swedes on the Delaware to submit to a capitulation. He then went with the other commissioners to Boston, where they administered the government.

CARRA'CA, LA, a t. of Andalusia, Spain, one of the chief naval arsenals of the kingdom, is situated 4 m. e.s.e. of Cadiz. It has been completely isolated from the mainland by artificial means; and so low is its situation, that it was necessary to erect the buildings on piles. It is defended by four forts, and is altogether very complete as an arsenal.

CARRAC'CI. See BOLOGNESE SCHOOL.

CAR'RAGEEN, often incorrectly called C. moss, or IRISH MOSS, a sea-weed (natural order, *algæ;* sub-order, *ceramiaceæ*), or rather several species of sea-weed, now used to a considerable extent both medicinally and as an article of food. The name C. is originally Irish; and the use of these sea-weeds appears to have been entirely confined to the peasantry of the coasts of Ireland, until, about 30 years since, they were recommended to general notice, and their medicinal virtues proclaimed by Mr. Todhunter, of Dublin. They are, however, found on the rocky sea-shores of most parts of Europe, and of the eastern shores of North America. The species which principally constitutes the C. of commerce is *chondrus crispus,* of which the varieties are remarkably numerous. It is 2 to 12 in. long, branched by repeated forking, cartilaginous, flexible, reddish-brown. *C. mamillosus* also frequently occurs. C., after being collected, is washed, bleached by exposure to the sun, dried, and packed up for the market. Its composition is as follows:

Vegetable jelly (carrageenin)	79.1
Mucus	9.5
Two resins	0.7
Ash	2.0
Fiber and water	8.7
	100.0

When treated for ten minutes with cold water, in the proportion of half an ounce of C. to three pints of water, and then boiled and strained, it yields, with or without spices, a very pleasant drink. With a larger proportion of C., a thickish liquid or *mucilage* is obtained; and on boiling down this decoction, and cooling, a stiff *jelly* is procured. Milk may be employed, instead of water, in the preparation of the various decoctions; and with the stronger one, along with sugar and spices, when thrown into a mold, a kind of *blanc mange* is obtained. C. is valued on account of its emollient and demulcent properties, and is likely to be found useful in most of those cases in which iodine might be exhibited; but its value seems to depend not a little on its being at once nutritious, a pleasant article of food, and easy of digestion. See GELATINE. It has been much recommended in pulmonary consumption. In some parts of Ireland, C. boiled with water (mucilage) is used instead of size for mixing with the more common colors in house-painting.

CARRAN'ZA, BARTOLEMÉ DE, 1503–76; a Spanish theologian of the Dominican order, a man of great learning and eloquence. Charles V. sent him as envoy to the council of Trent, where he maintained that it was the duty of priests to reside in their benefices. He accompanied the prince, afterwards Philip II., to England, where he went to settle the marriage with Mary. In England, Carranza became queen Mary's confessor, and worked hard for the re-establishment of Roman Catholicism. Philip made him archbishop of Toledo, an appointment that aroused such jealousy that Carranza was denounced as a heretic. He was kept in prison eight years, thence taken to Rome and kept in prison, being at last compelled to abjure opinions which he had never held. He was then degraded from his office and sent to a convent, where he died seven days afterwards. He was afterwards honored as a saint by the Spanish people.

CARRAPA'TO, a species of tick (q.v.) of the genus *ixodes,* which infests dry bushy places in the interior of Brazil, hanging in clusters of many hundreds on very slender twigs, and ready to attach itself to any quadruped or man that passes, instantly burying its beak in the skin, from which it cannot be detached without considerable force. Horses and oxen suffer very much from the attacks of the C., of which in dry seasons the numbers are so great that whole herds of cattle are destroyed by the exhaustion which they produce.

CARRA'RA, a t. of northern Italy, 60 m. s.w. of Modena. It is situated on the Avenza, near its mouth in the Mediterranean, and is surrounded by the marble hills which have made its celebrity. Many of the principal buildings are wholly or partially constructed of the inferior kinds of white marble. There are upwards of 30 marble quarries in the vicinity of the town, but not more than 6 or 7 furnish the marble used for statuary. Extensive works, fitted up with English machinery for sawing the marble, have been established near the town, in which are several shops for the sale of marble ornaments. Many foreign artists have set up their studios here, in order to save the expense which the export of the marble in its rough state entails. C. has a fine collegiate church of the 13th and 15th centuries, with some good sculptures, an academy of fine arts, and a pop., in 1879, of 26,577. The quarries have been worked for more than 2,000 years, and yield £75,000 worth of marble yearly.

The famous Carrara Marble is a white saccharine limestone, which derives its value to the sculptor from its texture and purity. It was formerly supposed to belong to the primitive rocks, but is now known to be a limestone of theoolitic period, highly altered by plutonic action.

CARREL, Armand, a celebrated French publicist and republican leader, was b. at Rouen in 1800, and was educated in the military school of St. Cyr. After serving for some years in the army, he went to Paris, and devoted his attention to political and historical studies. In 1830, in connection with Thiers and Mignet, he became editor of the *National,* the most spirited and able of the journals opposed to the government of Charles X. C.'s colleagues being employed by the new government, he was left to conduct the *National* himself, which he did with a spirit and a freedom such as had not been witnessed in France for a long time—which on more than one occasion checked the arbitrary power government attempted to exercise, and gained for him the high admiration and esteem of the popular party. Government prosecutions of course followed his outspokenness, and heavy fines were decreed against him; but these were paid by public subscription, and each conviction only made his journal more famous. C., however, dreaded revolution as much as he hated despotism, and had no sympathy with many of those who looked up to him as a leader. Provoked into a duel with Emile de Girardin, by an attack on his personal character, C. was mortally wounded, and died July 24, 1836. His funeral was attended by many of the most distinguished men in France.

CARRE'RA, Rafael, 1814–65; a Guatemalan of Indian and negro blood, who in 1837 led a band of insurgents and the next year captured the city of Guatemala. In 1839, he again held the city by force. In 1847, he was elected president of the republic, and in 1851, re-elected for life. In 1863, he made war on San Salvador, captured the capital, and expelled the president. Though almost a savage, and without education, his government on the whole was mild and reasonable.

CARRIACOU', one of the West India islands, 20 m. n.e. of Grenada; 7 m. long by 3 wide. Cotton is the chief production.

CARRIAGE. See Coach, Cart, Wagon.

CARRIAGE DEPARTMENT, Royal, at Woolwich, is one of the great national manufacturing establishments maintained for warlike armaments—its duty being the construction of gun-carriages, for army and navy, military wagons, and vehicles of all kinds, and the joinery of the army generally. The department was organized as a distinct establishment in 1803, and has been undergoing gradual enlargement ever since. Since the recent introduction of iron carriages for heavy guns, the department has had a new section added for ironwork. Until 1855, the board of ordinance had the direction of this department, but in that year it passed under the direct control of the secretary for war, who, since 1869, administers it through the surveyor-general of the ordnance. The works, store-rooms, and yards are of vast size, often employing from 2,000 to 3,000 hands. There are many steam-engines in various parts of the establishment; and the iron and wood cutting and shaping machines are of the highest order of excellence. The internal communications are carried on by locomotives on a tramway of 18 in. gauge. See Gun-Carriage.

CARRICAL, or Karikal, a French port within the limits of Tanjore, a district of the presidency of Madras. It stands in lat. 10° 55′ n., and long. 79° 53′ e., on the estuary of a small branch of the Cauvery, a tributary of the bay of Bengal. C. is accessible from the sea only after the periodical rains, and then only for coasting craft. The town and territory contain 63 sq.m., and about 50,000 inhabitants. The settlement, originally ceded to France by a native grant in 1759, and subsequently subdued by the British, was restored in 1814, on condition of being neither fortified nor garrisoned

CARRICKFER'GUS, a seaport t. of Ireland, is situated on the lough of Belfast, about 10 m. distant from the town of that name. Though locally within the co. of Antrim, it forms a co. of itself. C. extends nearly a mile along the north-western shore of the lough. Its chief feature is its castle, a fine picturesque object, supposed to have been erected by De Courcy in the 12th century. It is situated on a rock about 30 ft. high, projecting boldly into the sea, by which it is surrounded on three sides. The ballium or keep is 90 ft. in height. From the top of the keep a splendid view is obtained, extending, in a clear atmosphere, to the Mourne mountains and the Scotch coast. The castle contains a barrack, bomb-proof magazine, and ordnance store-rooms; and for many years, 22 pieces of ordnance, 12-pounders, were mounted on the works. A total change has, however, been made in the defense of the castle, and cannon of a very large caliber are now mounted, in order to command the entrance of the lough. In 1575, a wall 16 ft. high and 7 thick, with 7 bastions, to surround the town, was commenced, and completed in the year 1608; a considerable portion of the wall is still standing, and one of the 4 entrance-gates. On the 14th June, 1690, king William III. landed here with his army, 12 days before the battle of the Boyne. The rock on which the king stepped on landing is at the end of the quay, projecting from it, and still forming the landing-place. In 1760, commodore Thurot captured the castle, but on the approach of troops from Belfast, was forced to abandon it. The parish church, said to have been founded in the year 1164, on the site of a pagan temple, is a fine old building, dedicated to St. Nicholas. There are several other churches and chapels in the town., and several good day and Sunday schools in connection with the religious bodies, and a fine model school has been erected by the national board. There is a literary and scientific society, with reading-room, library, and museum. The fishery of the bay, which is famous for oysters of an unusual size, employs a good number of the inhabitants. There are four spinning-mills, one for weaving linen, one bleaching establishment, a starch manufactory, and a tan-yard. A market is held every Monday and Saturday, and a fair twice a year. Pop. '81, 10,009. The town returns one member to parliament. There are several barrows or tumuli in the vicinity. C. is connected by railway with Belfast, Portrush, and Larne. A few years since, a shaft was opened by the marquis of Downshire, in the hope of finding coal—without success; but salt of a superior quality, and in great abundance, was found. A company has been formed, and are working the mine. The length and breadth of the co. are nearly equal—about 5 statute miles.

CARRICK-ON-SUIR, a t. of Tipperary, situated, as its name implies, on the Suir, which is navigable at this point, 12 m. e. of of Clonmel, in the midst of very fine scenery. Pop. '81, 6,583. C. was formerly celebrated for its woolen manufacture, which has recently been considerably revived, and there are also linen and flax factories. It exports much agricultural produce. The town has recently much improved. C. became a place of note soon after the Norman conquest. There are the remains of a castle built in 1309, on the site of an old priory of the knights of St. John of Jerusalem.

CARRICK'S FORD, on Cheat river in West Virginia, where, July 13, 1861, a confederate force under gen. R. B. Garnett was routed by a federal force under gen. T A. Morris, and of the confederates several were killed.

CARRIER, Jean Baptiste, one of the most infamous and blood-thirsty members of the French national convention, was b. at the village of Yolai, near Aurillac, in Haut-Auvergne, in 1756. Entering the national convention in 1792, he took an active part in the formation of the revolutionary tribunal, voted for the death of the king, demanded the arrest of the duke of Orleans, and assisted in the overthrow of the Girondists. At Nantes, whither he was sent on a mission against the moderates, in Oct., 1793, he found ample means for indulging his insatiable thirst for human blood. The utter defeat of the Vendeans had filled the prisons with captives, and C. proposed and carried a resolution for murdering the unhappy prisoners *en masse.* Accordingly, on Nov. 15, he compelled 94 priests to embark in a vessel, under pretense of deportation, and during the night drowned the whole of them, by having the ship scuttled. Another of these *noyades,* as they were called, in which 138 persons were sacrificed, took place soon after, and they were repeated to the number of 25, their perpetrators facetiously terming them "vertical deportations." Other cruelties C. committed here. Men and women were tied together feet and hands, and thrown into the Loire; and this was called *mariage republicain* (republican marriage). With such recklessness were these murders committed, that, in one instance, a number of foreign war-prisoners were drowned by mistake. The water of the Loire was so poisoned by corpses, that its use for drinking and cooking was prohibited. Five hundred political prisoners were shot, as in a battue, on the bridge near Nantes. Even Robespierre was offended by these enormities, and recalled C., who boldly justified his own conduct before the convention. The fall of Robespierre was, however, soon followed by outcries against Carrier; judgment was decreed against him, and he perished under the guillotine, Dec. 16, 1794—dying with the protestation that, in all his cruelties, he had acted according to orders, and as a true republican patriot.

CARRIERE', Moritz, b. 1817; a German scholar, professor of philosophy at Giessen and Munich, and author of many works on philosophy, religion, æsthetics, poetry, etc.

He is a pronounced liberal, going so far as to advocate the conversion of the cathedral at Cologne into a free church. He is also an art critic of high rank.

CARRIÉRES, Louis de, 1662–1717; a Roman Catholic theologian of France, who published a literal commentary on the Scriptures, in which most of the comments were in the words of the Bible itself.

CARRIER PIGEON, a variety of the domestic pigeon (q.v.), remarkable for the degree in which it possesses the instinct and power of returning from a distance to its accustomed home; and which has been, therefore, much employed to convey letters from one place to another. In eastern countries, where such messengers are most frequently employed, it is the practice to bathe the pigeon's feet in vinegar to keep them cool, and to prevent it from alighting in quest of water, by which the letter might sustain injury. Pigeons intended for this use, must be brought from the place to which they are to return, within a short period, not exceeding a fortnight of their being let loose, and at a time when they have young in their nest; the remarkable fecundity of the C. P. affording particular facilities for its employment in this way. The bird is also kept in the dark and without food, for at least eight hours before being let loose. The instinct by which it is guided, like most other instincts, has received no sufficient explanation. That it recognizes objects by sight, and so directs its course, is nothing more than a conjecture, and as such, is only very partially supported by the fact of the great power of vision which these birds, in common with so many others, are known to possess, and by that of the C. P., on being let loose, immediately rising spirally to a great height in the air, as if to obtain opportunity for the exercise of this power. The C. P. has probably been more used in the Turkish dominions than in any other part of the world; and during the siege of Paris in 1871, it safely conveyed many important messages. Its rate of flight is not less than 30 m. an hour, and it has been known to pass over great distances still more rapidly. The variety generally described as the C. P. (*columba tabellaria* of Linnæus, *C. Turcica* of some authors, but not generally regarded by naturalists as a distinct species), is of remarkably large size, about 15 in. in length from the point of the bill to the extremity of the tail, and has the cere very large and carunculated, the eyes surrounded with a broad circle of naked red skin, and the wings reaching nearly to the extremity of the tail. There is, however, a smaller variety, which is said to be superior to it, and which has not the carunculated cere, nor the broad circle around the eye. Carrier pigeons are trained by being conveyed, when young, to short distances of a few miles from home and then let loose, the distance being gradually increased; and this training is said to render them much more secure as messengers.

CARRIERS, a class of persons who, in various forms, by land and sea, undertake the carrying of goods, particularly articles of commerce. In all countries aspiring to commercial intercourse, the Carrying Trade, as it is called, has been less or more developed. The method of carrying in Arabia, Persia, and some other countries in the east has, till the present time, been chiefly by means of the camel, an animal of great value, on account of its strength, patience, and power of endurance. See Camel. In England and Scotland, previous to general use of the wheel-carriages, goods were carried on pack-horses, as is still practiced in some parts of Spain with mules. See Pack-horse, also Mule. After the pack-horse came the one-horse cart and the four-wheeled wagon, as engines of land-conveyance. Carrying with one-horse carts settled down as a universal practice in Scotland, where it is still conducted in all districts not traversed by railways. The Scotch C., winding their way by roads over hill and dale, at the rate of about 20 m. a day, have ever been a respectable and useful body of men, exceedingly trustworthy, and moderate in their charges. In connection with Edinburgh, Glasgow, and other centers of traffic, they travel to and from provincial towns for the most part once a week on certain days, so that their arrival at any particular place may be reckoned on with great exactness. In England, the employing of wagons for carrying goods in connection with the metropolis and provincial towns is now of old date. These carriers' wagons, greatly limited in their range by the introduction of canals and railways, are still to be seen in some of the rural districts. A wagon of this kind is provided with four broad huge wheels; and being a heavy and clumsy engine of conveyance, is drawn by four horses, though, when roads were bad in old times, six horses were not unusual. The driver ordinarily rode on a pony alongside the vehicle; now he more frequently walks, carrying a long whip. The wagon has a hooped top with movable covering; and the hinder part has always been left vacant for the use of passengers, who are necessarily huddled together on straw. Traveling in the "tail of the wagon" is now entirely gone, or nearly so; but with all its rude inconveniences, it was common till past the middle of the 18th c., and has afforded scope for some of the most grotesque descriptions of Fielding and Smollett. The tedious process of carriage by these wagons largely increased the prices of goods, and retarded the growth of commerce. The first modification in the carrying trade took place by means of inland navigation, to which reference has already been made. See Canal. The conveyance of cotton goods from Lancashire, of earthenware from Staffordshire, of metal goods from Birmingham, of salt from Cheshire, etc., became much more easy than before, owing to the large quantity which could be packed in each barge, and to the great amount of work done by each horse. The chief owners of the old wagons became, in time, the chief owners of the

canal-boats; they paid rates or tolls to the canal companies. The celebrated English firm of Pickford & Co. has been for many generations, and still is, at the head of the goods carrying trade.

When railways were established, a great struggle ensued; the owners of the road-wagons and canal barges had a formidable competition. They wisely accommodated themselves to a state of things which they could not prevent, and added the trade of railway goods C. to their former business. Three systems were tried: 1. The company purchased road-wagons or vans, collected goods at the various towns, conveyed them by railway, and then distributed them at their several destinations. 2. The company confined their attention to the mere conveyance on their railway, leaving the collection and delivery to the ordinary carriers. 3. The company combined both systems, conveying on the railway everything that offered, and competing with the C. for the road-traffic. During the greater portion of the period in which the railway system has been in operation, the second of the above three plans has been adopted more extensively than either of the others. Taking as examples the greatest railway company and the greatest carrying firm, Messrs. Pickford had warehouses or deptos at all the principal towns where the London and North-western railway had stations. The merchants and manufacturers were customers, not to the company, but to the firm, for the conveyance of merchandise. Messrs. Pickford employed their own wagons and horses, clerks and porters, in collecting and delivering goods, and paid to the company so much per ton for the conveyance along the railway, the toll varying according to the nature of the goods and the distance run. There was seldom any quarrels or disputes under this system. The carrier was responsible to the customer from first to last for the safety of the merchandise; and he had a claim against the company for any injury while the merchandise was on the railway. Under the third system, disputes were much more frequent. The companies were bound by law to carry goods for all persons at certain tolls; but when they became road C. as well, they competed with the ordinary C. in a way which the latter could barely contend against. The Great Western railway has been unfavorably distinguished for jealousies and law-suits between the company and the carriers.

At the present time, the tendency is for the companies to take the responsibility of the whole conveyance, the C. acting as their agents, if willing so to do, or else endeavoring to maintain a fair competition. One of the greatest of the companies, the Midland, have in this way become C. on their own account, in order to obtain a share of the profit which accrues from road-traffic. The goods-vans traversing the streets of the metropolis, and other great towns, are now more frequently inscribed with the names of railway companies than with those of private carriers.

The goods-depots of the several railways are scenes of great activity during the night; for it is then that the arrival-trains are mostly unpacked, and the departure-trains mostly made up. During the day, vans are collecting goods from manufactories and warehouses; these goods are sorted at the deptos, and are, when evening comes on, distributed among different trains, according to the part of the country to which they are to be conveyed. On the other hand, goods-trains arriving during the evening and night are unpacked, the goods classified according to districts, and sent out for delivery by road-vans on the following day.

The four-horse broad-wheel wagons, as already said, have almost disappeared from English roads; vans of lighter construction sufficing to convey merchandise from and to the various railway stations. Canals still command a trade, but it is chiefly in coal, stone, lime, ores, slate, bricks, and other articles very bulky in proportion to their value. The conveyance of manufactured goods has, for the most part, passed over to the railways.

In towns, there are C. whose business is confined wholly to short distances. Taking the metropolis as an example, there are C. residing in all the villages and hamlets round about, each possessing one or more single-horse covered carts. Every morning the cart, containing miscellaneous articles collected in the village or hamlet, goes to London, and delivers each article at the particular house or establishment to which it is addressed. When thus emptied, it receives a supply of packages or other articles going *from* London to the suburbs, and makes its return-journey in the evening. The plan is cheap and convenient, and does not seem likely to be supplanted by any other; for no amount of railway extension would wholly accommodate *short* traffic. For the metropolis more strictly, however, an excellent system has been established by the "London parcels delivery company." Two or three times a day, parcels are conveyed from receiving-houses all over the metropolis to a central depot near Fetter lane, there sorted, and sent out again for delivery. The metropolis, out to a wide distance, is separated into districts, and one or more carts, filled with parcels, are sent to each district at certain hours of the day. The speed is rapid, the times are punctual, and the service in general well conducted. The suburban C. have arranged among themselves a sort of central depot or "house of call" in the Old Bailey, for the exchange of traffic; but their system is not so well organized as that of the company just named.

The progress of improvement in the English CARRYING TRADE is a type of the advances similarly made in the United States, where canals, railways, and coasting steam-vessels have generally superseded the old tedious methods of conveyance; and it is chiefly on

the long and almost trackless routes to the shores of the Pacific that are now seen the old processes of carriage by pack-mules and horses and bullock-wagons, the cost of transit by these means being very great.

The term CARRYING TRADE has latterly been applied more specially to all kinds of conveyance of merchandise by sea, whether across the ocean or along the coast. In this broad view, it, in reality, involves the whole question of mercantile marine, British and foreign.

CARRIERS, LAW RESPECTING. A carrier, in law, is one who offers to the public to convey passengers, or goods, from one place to another, for hire. The offer must be general; for a private person who contracts with another for carriage, is not a carrier in the legal sense, and does not incur the peculiar responsibilities which, in almost every country, it has been found expedient to attach to the occupation of a public or common carrier. Carriage, in law, is thus a peculiar modification of the contract of hiring. In Rome, the responsibilities of carriers by water were regulated by a prætorian edict, which was applicable also to inn-keepers and stablers (Nautæ, Caupones, Stabularii, Dig.; lib. iv. t. 9); and from that edict the law of carriage in modern Europe has been mainly borrowed, sometimes directly, as in Scotland, sometimes indirectly, as in England. The ground on which the edict increased the responsibilities attaching to an ordinary contract of hiring was, that the persons whom it enumerated were under peculiar temptations to consort, either personally or through their servants, with thieves and robbers, without the connection being such as to admit of proof; and that the public safety consequently required that they should be held responsible for whatever had been intrusted to them, till its safe delivery at the place to which they had undertaken to convey it. This responsibility in our own law extends not only to the acts of the carrier's servants, but also to those of the other guests in an inn, or the other passengers in a conveyance. The only exception to this liability at common law is in the case of loss arising from the act of God (q.v.) or the queen's enemies—i.e., the fury of the elements, or war. But there are several statutory limitations. The liability for gold and silver, and articles of unusual value, is restricted to £10, unless the extra value has been previously stated and paid for as insurance against the greater risk (11 Geo. IV. and 1 Will. IV. c. 68, and 17 and 18 Vict. c. 31); and the proof of value is laid on the person claiming compensation. But the last-mentioned act, commonly called the railway and traffic act of 1856, provides, on the other hand, that the company shall be liable for neglect or default in the carriage of goods, animals, etc.; notwithstanding any notice or condition or declaration made by the company, for the purpose of limiting their liability. The decisions of the courts have also somewhat limited the universal responsibility of the carrier. For example, it has been decided that he is not liable, *qua* C. (and the same applies to an inn-keeper), for money taken from the pockets of the traveler; but that, if the money has been taken from the pockets of clothes which have been stolen, or from trunks which have been broken into, his responsibility comes into operation.

Under C. are included carters and porters, who offer themselves for hire, to carry goods from one part of a city to another. Whether the same be the case with hackney-coachmen, is more doubtful; though, from the extent to which they are now employed in the transport of luggage, there seems no sound reason for an exemption in their case. Wharfingers and warehousemen are liable only under the special contracts into which they may have entered, or in accordance with mercantile usage. In England, it has been decided that lodging-house keepers are in a different position from carriers and inn-keepers, on the ground that they do not profess to entertain all-comers, or to receive their goods. C. are liable to make good to the owners of goods intrusted to them all losses arising from accidental fire. This rule was introduced into Scotland by the mercantile law amendment act of 1856. Carriers have a lien upon the goods they have carried for payment of the carriage only. The lien is, however, restricted to the particular goods to which the carriage refers, and ceases on possession of them having been given up. It does not cover any account or balance due either by the sender or consignee to the carrier.

CARRIERS (*ante*). In the United States, common carriers are such as transport for hire for all persons indifferently. They operate both on land and water, and embrace stage-coach proprietors, railway and steamboat companies, truckmen, teamsters, express companies, etc., including owners and masters of every kind of vessel or water-craft who come before the public as the carriers of freight of any kind for whomsoever may choose to employ them, for either a long or a short voyage. Common C. are responsible for loss or damage during transportation from whatever cause, "except the acts of God, or of the public enemy." The act of God means only such inevitable accidents as occur without man's agency. The carrier is not responsible for losses occurring from natural causes, such as fermentation, evaporation, freezing, the ordinary decay of perishable articles, or the natural wear in the course of transportation, provided he exercises reasonable care to have such dangers as little as practicable. C. who undertake general business are bound to carry all matter that offers, under liability of legal action if they refuse without just excuse; but any carrier may restrict his business to certain goods, in which case he is not bound to accept things out of his line. A carrier may

require payment of freight in advance; and he is entitled to a lien upon the goods for his freight and for what he advances to other carriers. But all common-law responsibility may be qualified by special contracts. The bill of lading, or receipt for the goods, is an acknowledgment of the carrier's responsibility, and is presumed to name exceptions from responsibility if any there be. Railway companies, steamboat owners, and other C. who allow express companies to carry parcels and packages on their cars, boats, or other vehicles, are liable as common C. to the owners of the goods for loss or damage without regard to the contract between them and such express carriers. Railways, steamers, etc., carrying passengers, although not liable for injury to passengers without the C.'s fault, are responsible for the baggage of such passengers intrusted to them as common C., and the responsibility continues until the delivery of the baggage to the owner, or to his order. The baggage-check is the same as a bill of lading for goods, and is evidence of the responsibility assumed. Jewelry and a watch in a trunk are considered baggage, but money, beyond a reasonable amount for expenses, is not so considered. The responsibility of C. begins upon the delivery of the goods for immediate transportation. A delivery at the usual place of receiving freight, or to those employed by the company in the usual course of business, is sufficient. But where C. have a house at which they receive goods that are not to be forwarded until further order or a later time, such C. are in the mean time responsible only as depositaries; and where goods are received as by wharfingers, or warehousers, or forwarders, and not as C., liabilities are incurred only for ordinary negligence. The responsibility of the carrier terminates when, after the arrival of the goods at their destination, a sufficient time has elapsed for the owner to receive them in business hours. After that the carrier may store them, and is responsible only for ordinary care. The agents of corporations which are common C., such as railway and steamboat companies, bind their principals to the full extent of the business intrusted to their control, whether they follow their instructions or not; nor will it excuse the company to show that the agents acted willfully in disregard of instructions. The carrier has an insurable interest in the goods both in regard to fire and marine disaster, except such as result from inevitable accident, such as fire by lightning-stroke. If a particular time is set for the delivery of goods, damages may be recovered for exceeding that time. The carrier is liable upon general principles where the goods are delivered through his default, to the extent of their value at the place of destination; and this includes the profits of the adventure. If the goods are only damaged, or not delivered in time, the owner is bound to receive them. He will be entitled to damages, but he cannot repudiate the goods and recover for the total loss.

Carriers of Passengers. (See Carriers, *ante.*) Persons who carry passengers are not held responsible as insurers of the safety of their freight as carriers of goods are held. But they are held to the highest degree of watchfulness and care in all the conduct of their business. So far as human foresight and prudence can secure the passenger from harm, there is a right to demand it of all who assume the transportation of persons. It is a practice to print on passes or free tickets a notice that such a passenger assumes the risk of personal injury, but the courts have again and again decided that this in no degree lessens the carrier's liability, holding even that the transporting party was as much responsible for a non-paying as for a paying passenger. Passenger-carriers are responsible for the baggage of their passengers, and for the safety of parcels intrusted to them or their agents. Many decisions of American courts touch various points in the case of passengers, but all sustain the principle that if anything more could have been done by the carrier to insure the safety of his passengers, and injury occur in consequence of the omission, he is liable. Passenger-carriers are not responsible where the injury occurs through the negligence of the passenger; but when there is intentional wrong on the part of the carrier, the injured party may recover notwithstanding his negligence. And so also, where the carrier's negligence contributed only remotely to the injury and the passenger's culpable want of care was its immediate cause, a recovery may still be had. Passengers leaping from a conveyance in consequence of any just sense of peril may recover for injury. Carriers are bound to carry for the whole route for which they stipulate, and according to their public notices and the general customs of their business; but they are not bound to carry persons disorderly in conduct, or those having contagious diseases, or who are in any way dangerous or offensive to other passengers. The carrier is liable for damages if he fail to deliver the passenger in a reasonable time, or according to the published schedule. The sale of through tickets for a route operated by several successive companies of carriers having no partnership connection, renders each company liable for injuries to passengers occurring only in the part of the route which pertains to it severally. One decision in case of the death of a passenger was that the jury are to estimate damages for the death as they would for an injury to health, by the probable financial accumulations of the deceased had he survived, or not been injured through the culpable negligence of the carrier; therefore he or his estate is entitled to recover not only the damages sustained up to the time of trial, but all prospective damages likely to accrue from the injury. Passengers must conform to the rules of the road or company with regard to purchasing, showing, and giving up tickets, and in respect to trains and cars. But it has been held that when one purchased a ticket indorsed "good for this trip only," and was

unexpectedly detained, he could lawfully demand transportation by another train, even on the next day. Railway companies may exclude merchandise and articles known as "express" matter from the passenger cars. When an accident occurs to a train, or a stage-coach is overturned, the fact is considered *primâ facie* evidence of fault on the part of the company or its agents. With regard to steam and other vessels, very strict rules are enacted by governments for the safety of passengers and property, regulating the number of passengers, the amount of provisions, the navigating of the ship, pilotage, etc.

CARRION CROW. (See CROW.) C. C., also called *black vulture*, is not in America, as in Britain, the name of a species of crow, but of one of the vulture family. See VULTURE.

CARRION FLOWERS, a name which, on account of their smell resembling that of putrid meat, has been given to the flowers of many species of *stapelia*. The genus *stapelia* belongs to the natural order *asclepiadeæ*, and is remarkable for the excessive development of the cellular tissue of the stem and reduction of that of the leaves, resulting in a general aspect like that of the *cactus* family. The species are natives of the cape of Good Hope. The flowers are often large, and not devoid of beauty, but the carrion stench is very strong. It is not yet known to what chemical substance it is owing.

CARRO', JEAN DE, 1770–1857; b. Geneva; a German physician in Vienna and Carlsbad, noted for his advocacy of Jenner's system of vaccination as a guard against small-pox. Through his efforts, kine-pox inoculation was introduced into India, where the people, hearing that the vaccine matter came from a cow, ascribed its origin to their sacred cow, and called it by a name meaning "immortality." Carro wrote several works on medical subjects.

CARROLL, a co. in n.w. Arkansas, on the Missouri border, and King and White rivers; 700 sq.m.; pop. '80, 13,337—64 colored. Surface varied, and soil generally fertile. There are quarries of excellent yellow marble. Co. seat, Carrollton.

CARROLL, a co. in w. Georgia, on the Alabama border, and the Chattahoochee and Tallapoosa rivers; 572 sq.m.; pop. '80, 16,903—2310 colored. The surface is mostly mountainous; but the soil is generally fertile, producing corn, wheat, cotton, etc. One or two gold-mines have been profitably worked. Co. seat, Carrollton.

CARROLL, a co. in n.w. Illinois, on the Mississippi river, and crossed by the Western Union railroad; 416 sq.m.; pop. '80, 16,985. The surface is uneven, occupied by prairie and forest, and the main products are cereals, butter, and wool. Co. seat, Savannah.

CARROLL, a co. in n.w. Indiana, on the Wabash and Tippecanoe rivers, traversed by the Toledo, Wabash and Western railroad, and the Wabash and Erie canal; 378 sq.m.; pop. '80, 18,347. It has a diversified and well-timbered surface, and productive soil, agriculture being the chief business. Co. seat, Delphi.

CARROLL, a co. in central Iowa, on the Chicago and Northwestern railroad, drained by the North and Middle Raccoon rivers; 600 sq.m.; pop. '80, 12,351. The climate is good and the soil fertile. Co. seat, Carrollton.

CARROLL, a co. in n. Kentucky, on the Ohio and Kentucky rivers, and Louisville, Cincinnati and Lexington railroad; 200 sq.m.; pop. '80, 8953—771 colored. It has a calcareous soil, with abundance of limestone. Productions chiefly agricultural. Co. seat, Carrollton.

CARROLL, a parish in n.e. Louisiana, on the Mississippi river and bayou Bœuf; 1050 sq.m.; pop. '70, 10,110—7,718 colored. It has a level surface, producing corn and cotton. Seat of justice, Providence.

CARROLL, a co. in n. Maryland, on the Pennsylvania border and the Patapsco and Monocacy rivers, reached by the Baltimore and Ohio, and crossed by the Western Maryland railroad; 500 sq.m.; pop. '80, 30,992—2284 colored. It has a hilly surface, and rather thin but well-cultivated soil; its productions are wheat, corn, butter, tobacco, etc. Co. seat, Westminster.

CARROLL, a co. in w. Mississippi, on the Yalabusha, Yazoo, and Big Black rivers, and crossed by the Mississippi Central railroad; 900 sq.m.; pop. '80, 17,800—9969 colored. The surface is level, and the soil is remarkably fertile; chief productions, corn and cotton. Co. seat, Carrollton.

CARROLL, a co. in n.w. Missouri, between the Missouri and Grand rivers, traversed by a branch of the North Missouri railroad; 700 sq.m.; pop. '80, 23,262—1473 colored. It has an uneven surface, in many parts covered with black walnut and oak forests; its soil is generally productive. Chief business, agriculture. Co. seat, Carrollton.

CARROLL, a co. in n.e. New Hampshire, on the Maine border and Winipiseogee lake, reached by the Portland and Ogdensburg, and the Portsmouth, Great Falls and Conway railroads. The surface is mostly mountainous; productions chiefly agricultural. Co. seat, Ossipee. Pop. '80, 18,222—16 colored.

CARROLL, a co. in e. Ohio, traversed by the Tuscarawas branch of the Cleveland and Pittsburg, and the Carrollton and Oneida railroads; 360 sq.m.; pop. '80, 16,416. It is hilly, but well-watered and fertile. Iron and coal are found. The chief productions are grain, hay, butter, and wool. Co. seat, Carrollton.

CARROLL, a co. in n. Tennessee, on the Big Sandy and Obion rivers, and the Louisville and Memphis, and the Nashville and Northwestern railroads; 625 sq.m.; pop. '80, 22,104—5576 colored. It is level and fertile, with forests of black walnut, hickory, maple, and oak. Chief productions, corn, wheat, cotton, and butter. Co. seat, Huntingdon.

CARROLL, a co. in s.w. Virginia, on the North Carolina border, drained by the Kanawha river; 440 sq.m.; pop.'80, 13,323—346 colored. The surface is rough, but well adapted to grazing. Copper, iron, and lead are found. The Grayson sulphur springs are much visited. Productions chiefly agricultural. Co. seat, Hillsville.

CARROLL, Charles, of Carrollton, b. Md., Sept. 20, 1737; d. Nov. 14, 1832, aged 95 years; the last survivor of the fifty signers of the declaration of American independence. He was educated in the Jesuit colleges of St. Omer and Rheims; studied law at Bourges, Paris, and London, returning to America in 1764. He inherited the last and the largest of the old manorial estates of Maryland, a property estimated in 1775 at $2,000,000, and he was then considered the wealthiest private citizen in the colonies. In 1775, he was chosen a member of the "committee of observation" at Annapolis, and in the same year sent to the provincial convention. In 1776, he was one of the commissioners sent to persuade the Canadians to join in the revolt against England. Returning to Maryland, he was prominent in bringing the colonial delegates to agree upon union for independence; and July 4, 1776, he was sent to congress, where, Aug. 2, he signed the declaration. At the time of signing, a delegate, alluding to Carroll's great wealth, remarked, "There goes a few millions; but there are many Charles Carrolls, and the British will not know which one it is;" whereupon Carroll immediately added after his name *of Carrollton*, an addition that was ever afterward respected. In congress, he was one of the board of war. About the close of 1776, he was one of the committee that drafted the Maryland constitution, and was chosen to the senate of that state. In 1777, he was again sent to congress, and in subsequent years was repeatedly elected to the state legislature. In 1789, he was United States senator; in 1799, one of the Maryland and Virginia boundary commission. July 4, 1821, but four of the signers of the declaration were living: Carroll, William Floyd of New York, and ex-presidents Adams and Jefferson. Floyd died in the next month, and Adams and Jefferson both died July 4, 1826, leaving Carroll the sole survivor. His last public act was the laying of the corner-stone of the Baltimore and Ohio railroad, July 4, 1828, when in his 90th year. Carroll's grand-daughter, Miss Caton (d. 1853), was the Marchioness of Wellesley

CARROLL, John, D.D., LL.D., 1735–1815; cousin of Charles Carroll of Carrollton; an American Roman Catholic prelate, educated in Europe, and for a time professor at Bruges. Returning to America, he was selected, with his cousin and Dr. Franklin, to go to Canada to urge the people to join the colonies in their effort for freedom. After the revolution, C. was appointed vicar-general, and in 1789, was promoted to bishop, being the first bishop of the Roman Catholic church in the United States. A short time before his death he was made archbishop.

CARROLL, John Lee. See page 890.

CARROLLTON, a city in Greene co., Ill., 34 m. n.w. of Alton, on the Jacksonville and Alton railroad; pop. '80, 1,934. Its trade is in lumber, agricultural products, and coal.

CARROLTON, a city in Louisiana, on the Mississippi, 7 m. above New Orleans, in Jefferson parish; pop. 6,168. Its trade is chiefly in sugar and molasses. Horse railroads connect with New Orleans.

CAR'RON, a village in Stirlingshire, Scotland, on the right bank of the Carron Water, 3 m. e.n.e. of Falkirk. It is celebrated for its ironworks, which are among the largest of the kind in Britain. The works were established in 1760; and are carried on by a company, who employ a great number of men. Pop. '81, 902.

CARRONADES' are short iron guns, invented by Mr. Gascoigne, and named after the Carron iron works in Scotland, where they were first made. They are lighter than ordinary guns, and have a chamber for powder, like mortars. They were made standard navy guns in 1779, to be carried on the poop, forecastle, and upper works. Being manageable by a smaller number of hands than guns, and being very useful in close engagements, they were held in much favor during the great war: the seamen called them "smashers." A 68-pounder carronade weighed not much more than half as much as the 42-pounder gun in use in 1779. They range from 68-pounders down to 6-pounders. The denominations, weights, lengths, caliber, etc., of the chief varieties of carronade are noticed under Cannon.

Some C. are made shorter with a given bore. C. are but little used, except by the English and French. Though valuable at close quarters, they are no match for long guns at a distance; and therefore a ship armed only with C. would fare badly in a general action. In recent years, C. have to a considerable extent been replaced in the English navy by howitzers, long guns, and shell guns.

CARRON OIL. See Burns

CARROT, *Daucus,* a genus of plants of the natural order *umbelliferæ.* They are mostly natives of the countries surrounding the Mediterranean sea. The common C. (*D. carota*) is a biennial plant, eommon in Britain and most parts of Europe, also in the Caucasus; and is universally cultivated not only in Europe and the European colonies, but in China, Cochin China, etc., for the sake of its root. The root of the wild plant is slender, woody, and of a very strong flavor; that of the cultivated variety is much thicker and more fleshy, much milder in its flavor and qualities, generally red, but sometimes orange or yellowish white. The sub-varieties in cultivation are also distinguished by their form—some being longer and more tapering than others—by their size, and by the duration of their growth; the *early* kinds being also comparatively small, and almost exclusively cultivated in gardens for culinary use, whilst the larger and *late* kinds are often also grown in fields, for feeding cattle. The field cultivation of the C. is carried on to a much greater extent in some parts of France, Germany, and Belgium, than in Britain; but it is increasing in Britain. The C. appears to have been cultivated at an early period in Flanders and Germany, and to have been introduced into the gardens of England in the beginning of the 16th century. In the reign of Charles I., ladies wore C. leaves as an ornament instead of feathers; and the beauty of the leaves is still occasionally acknowledged by placing a root, or the upper portion of one, in water, that it may throw out young leaves to adorn apartments in winter. The C. prefers a light and rather sandy soil, and often succeeds very well on a peat soil. It is very liable to the attacks of the larva of the crane fly (q.v.), by which the greater part of a crop is sometimes destroyed when the young roots are about the thickness of a quill; on which account, in gardens where there is particular reason to apprehend danger from this enemy, it is the practice to make a number of successive sowings, some of which may probably escape. As an article of food, C. contains a large amount of what are called heat-producing compounds, with a small proportion of flesh-forming matter. It consists essentially of starch, sugar, and albumen, along with a volatile oil, which communicates a flavor to many dyspeptics very unpleasant. The following is the composition of dried carrot:

Starch and sugar	93.71
Albumen	4.35
Red neutral substance (carotin)	0.34
Fixed and volatile oils	1.00
Ash	0.60
	100.00

C. is easy of digestion, and gently laxative. Boiled C. is used as a poultice for foul ulcers and other sores, and as a vermifuge. Grated C. forms an agreeable cooling but also stimulant application. A sirup is prepared from carrots; and when cut into small pieces and roasted, they are occasionally used in Germany as a substitute for coffee. A strong ardent spirit is distilled from them in some parts of Europe, 10 lbs. of carrots yielding about half a pint. C. seeds are employed as a diuretic, also as a carminative and stimulant; those of the wild C. being preferred.—Besides the crane fly, already noticed, carrots have numerous other insect enemies. One of the most troublesome is the carrot fly (*psila rosæ*), a small dipterous fly, the larvæ of which, by eating away the surface of the root, cause what is commonly known as *rust* in carrots, and prepare them for the further operations of millepedes and other destroyers. The larvæ of several species of moth (*depressaria*) are very injurious to them when in flower and seed. An aphis (*A. dauci*) often kills the young plants.

CARROU'SEL (Fr.), a species of knightly exercise, which, down even to the beginning of the 18th c., was very common in all the courts of Europe. C. was a kind of imitation of the tournament, and for a time after the discontinuance of the latter, seems to have supplied its place. The dresses, for the most part, were those of the knights of former times, and the combatants, or rather competitors, were divided into two parties, usually according to their different nationalities. One of the favorite exercises in France consisted in running at the pasteboard head of a Moor or Turk with a lance, cutting it down with a sword, or firing at it with a pistol. Another of these tests of skill and horsemanship, if not of courage, consisted in carrying off a whole line of rings, which were suspended for the purpose. The C. in France was not known earlier than the reign of Henry IV.; but it had existed for some little time previously in Italy. There were brilliant carrousels under Lous XIII., and two celebrated ones were given in honor of Mademoiselle de la Vallière—the one at Paris in 1662, the other at Versailles in 1664. The place where the first of these fêtes was held, has ever since been called the place du carrousel. A revival of the C. was attempted at Berlin in 1750; and in 1828 the cavalry school at Saumur held one in honor of Madame la Duchesse de Berry. The so-called Eglinton tournament—an entertainment given some years ago by the chivalrous earl of Eglinton—was in reality a carrousel.

CARRUTHERS, Robert, ll.d. See page 890.

CARSE is a term applied in Scotland to low lands adjoining rivers. The word is of uncertain origin. In Stirlingshire, it is restricted in its sense to the level alluvial soils which are only a few feet above the river Forth. In Perthshire, it also applies to the whole of the slightly undulating lands to the n. of the Tay, which form the C. of Gow-

rie. C. soils usually consist of argillaceous deposits, which produce crops of great luxuriance, although there are some which consist of hungry and barren clays. The richest of them are of a hazel color, and become friable when exposed to the action of frost; the poorest, on the other hand, are of a yellow color, containing little vegetable matter to render them amenable to cultivation. The best kinds of C. soils are generally farmed on the six-course shift—1. Grass; 2. Oats; 3. Beans; 4. Wheat; 5. Potatoes; 6. Turnips or fallow. Large crops of grass are grown when the clover-plant catches. It is mostly made into hay, and the after-math is used for soiling horses and cattle in the straw-yards. The land is seldom pastured, as the feet of animals trample and destroy the grasses, when the weather is wet. The oat-crop is more uncertain on the carses, but in favorable years, the yield is large, and the quality of the grain is excellent. Beans are very successfully grown, indeed the best of the C. soils are the best bean-soils in Scotland. Where the land is rich, and not too stiff, the potato is sometimes largely grown. On the poorest description of the C. soils, the potato does not thrive. Wheat can be grown in closer succession on the C. lands, than on any other description of land with the same expenditure of manure. A large stud of horses are required on C. lands, to enable the farmers to prepare the land for the various crops, at the moment when the season suits. A small portion of the land is still usually summer-fallowed, as it is found that it cannot be kept thoroughly clean by green crops in rainy seasons.

CARSON : co. Tex. See page 890.

CARSON, Alexander, ll.d., 1776–1844; an Independent or Congregational preacher of the n. of Ireland, officiating at Tubbermore for 30 years, within which time he became a Baptist and an earnest advocate of their views.

CARSON, Christopher, or "Kit Carson," b. Ky., 1809, d. Col., 1868; one of the most famous pioneers and scouts of the west. When about 24 years old he was appointed hunter to Bent's fort, where he remained eight years; he was then engaged as a pioneer in Fremont's explorations among the Rocky mountains. In 1847, he was made lieut. in a rifle corps of the regular army. In 1853, he drove 6,500 sheep over the plains and mountains to California. He was afterward Indian agent in New Mexico, and was instrumental in making a number of treaties of importance. In the civil war he did good service on the borders, and was brevetted brig.gen. The remarkable adventures of "Kit Carson" often surpass the most extravagant romance, though the most daring of them are literally true. Personally he was as modest as he was brave.

CARSON CITY, the capital of Nevada, in Eagle valley, Ormsby co., 4 m. from Carson river, 178 m. n.e. of San Francisco, on the Virginia and Truckee railroad. It is in a picturesque region near the base of the Sierra Nevada, and only about 10 m. from lake Tahoe. There is a branch mint in Carson City which receives immense deposits of silver and gold ore. There are a state-house, several churches and schools, and many mining and manufacturing establishments. Pop. '80, 4,229. The state prison is 2 m. n.e. of the city.

CARSON RIVER, a stream in Nevada, rising in the Sierra Nevada, passing n. near Carson City and Lyon, and emptying into Carson lake, a body of water about 15 miles long, that appears to have no outlet.

CARSTAIRS, William, a distinguished political and ecclesiastical character of the 17th c., who took a very active part in bringing about the revolution of 1688, was b. at Cathcart, near Glasgow, Feb. 11, 1649. He was educated at the village school of Ormiston, in East Lothian, and subsequently at the university of Edinburgh, where he displayed a remarkable aptitude for learning. In his 24th year, Scotland being then in a most unsatisfactory state, alike from a political and religious point of view, C. went to study theology at Utrecht. His scholarship, polite address, knowledge of men, and great political information, especially regarding his own country, recommended him to the notice of the prince of Orange, who chose him as his confidential adviser in all matters relating to Britain. In 1682, being in England on a mission of observation from Holland, he was employed to negotiate between the English and Scotch conspirators in the Rye House plot. With others implicated, he was arrested and put to the torture of the thumbscrew, but refused to confess anything that had not been previously revealed, and that only on condition that what he said should not be used in evidence, either directly or indirectly, against any other person. At this time, he had secrets from Holland of the greatest importance in his possession, which he carefully concealed, although there can be no doubt that their revelation would not only have saved him from torture, but have obtained for him great reward and honor. Britain, therefore, owes very much indeed to the firmness of C. at this juncture. He returned to Holland about the beginning of 1685; and, acting mainly on his advice, the prince of Orange planned and carried out the invasion of 1688. He accompanied the prince as chaplain, and after the settlement of the crown, when the prince had been firmly established as William III., C. was instrumental in effecting a reconciliation between him and the Scottish church, when the ill advice of other councilors had nearly led to an open rupture. From 1693 to the death of the king in 1702, he could not have had more influence in Scottish affairs if he had been prime-minister of the country; and his authority in church matters was such, that he was popularly called "cardinal Carstairs." He was elected principal of the university of Edinburgh in 1704, and in this capacity used all his influence with

government to obtain an increase of patronage for the Scottish colleges. In the same year, he was presented to the church of Greyfriars, and was appointed moderator of the general assembly next succeeding, an office to which he was four times elected in the course of eleven years. He died Aug., 1715, deeply regretted by the whole nation, and leaving a reputation for scholarship and sincere piety, as well as for unbounded charity and political sagacity rarely equaled. See *Life of C.*, by Rev. Dr. Story (1874).

CARSTENS, Asmus Jacob, an eminent German artist, was b. near Schleswig, May 10, 1754. In 1762, he went to Copenhagen, where, when first introduced to the royal gallery of paintings and casts from the antique, he was so excited that he shed tears of joy. After staying seven years in the Danish capital, where he produced his "Baldur's Death," and "Eolus and Ulysses," supporting himself chiefly by portrait-painting, he commenced a journey on foot to Rome, but was obliged to return for want of means after reaching Mantua. He resided in Lubeck for some time, but through the kindness of a wealthy amateur artist named Rodde, he contrived to reach Berlin, where his great composition, the "Fall of the Angels" (with 200 figures), gained for him an appointment as professor in the academy, while his decoration of a saloon in the Dorville palace obtained for him an introduction to the king and a pension. He was now enabled to visit Rome, where he devoted himself to the study of the works of Michael Angelo and Raphael. His first work in Rome, a "Visit of the Argonauts to the Centaur Chiron," was distinguished by purity of style, beauty of forms, and fine distribution of light. His numerous subsequent drawings mostly represented scenes from the ancient classic poets, with subjects from Ossian, Dante, and Shakespeare. C. died May 26, 1798.

CART, a species of carriage with two wheels, in which respect it differs from the ordinary wagon that has four wheels. There are different kinds of carts, according to the nature of the goods or articles to be carried, and they also differ considerably in different countries. The C. is little seen in England, where the heavy and more capacious wagon takes its place. It is, however, used for agricultural and other purposes in Cumberland and adjoining northern counties. There, it differs only in a slight degree from the C. universally used in Scotland. The Scotch C. is an exceedingly convenient form of carriage for general merchandise, or for agricultural produce, and well adapted for being drawn on roads in a hilly country. A material advantage consists in its weight, being about only half a ton, while its usual load is from a ton to 22 cwt.; from which circumstance it is a particularly handy vehicle for comparatively light loads, and so far is superior to the English wagon, which is best adapted to carry huge loads of from two to three tons. In carrying hay, straw, or grain from the harvest-field, Scotch farmers employ a peculiar kind of C. without sides to admit of a bulky load; but they also, as occasion serves, use for a similar purpose an ordinary C., on which they place a movable frame. All grain for market is carried in the one-horse C., and a driver takes charge of two carts. The following advantages of one-horse carts are well enumerated by lord R. Seymour: "A horse, when he acts singly, will do half as much more work as when he acts in conjunction with another; that is to say, that two horses will, separately, do as much work as three conjunctively. This arises, in the first place, from the single horse being so near the load he draws; and in the next place, from the point or line of draught being so much below his breast, it being usual to make the wheels of single-horse carts low. A horse harnessed singly has nothing but his load to contend with; whereas, when he draws in conjunction with another,, he is generally embarrassed by some difference of rate, the horse behind or before him moving quicker or slower than himself; he is likewise frequently inconvenienced by the greater or less height of his neighbor: these considerations give a decided advantage to the single-horse cart. The very great ease with which a low C. is filled may be added; as a man may load it, with the help of a long-handled shovel or fork, by means of his hands only; whereas, in order to fill a higher C., not only the man's back, but his arms and whole person must be exerted." To these just observations it need only be added that in many parts of England there is a wasted expenditure in horse-power, a pair of horses being often set to draw a clumsy wagon to market, containing a load which could with the greatest ease be drawn by one horse in a less ponderous machine.

The one-horse C. is employed by carriers all over Scotland, the load being usually piled high in a square form, and covered in with a woolen wrapper, in which state the C. is drawn 18 to 20 miles a day. See Carriers. In France and Germany, the carrier's C. is a more gigantic machine. Long in the body, very strong in construction, and poised on two high wheels with broad rims, this continental C. carries enormous loads, almost equal to what are seen in the large wagons of England. The ingenious manner in which the load is adjusted to rest exclusively on the wheels, and so relieve the single horse in the shafts, is matter of surprise to all strangers. All carts, whatsoever, in Great Britain, must bear the name and address of the owner, painted conspicuously on them, according to statute 1 and 2 Will. IV. c. 22. See Wagon.

CARTAGE'NA, a fortified seaport of Spain, on a bay of the Mediterranean, in lat 37° 36′ n., long. 0° 57′ w. It is built partly on the declivity of a hill, and partly on a plain extending down to the sea, and is inclosed by hills which screen it from all winds. The harbor is one of the best in the Mediterranean, capacious enough to hold the largest

fleets. The entrance is narrow, and completely commanded by the fortifications on an island called La Isoletta, on the south. It was formally the largest naval arsenal not only in Spain but in Europe. The city, which is surrounded by walls, has a Moorish aspect; its streets, cathedral, and the ruins of an old castle being of that architecture. C. has manufactures of sail-cloth and glass, besides extensive blast-furnaces and smelting-works, and a trade in barilla, agricultural produce, and esparto grass. The tunny fishery is important, and its ancient silver and lead mines, recently re-opened, are again productive—the export of lead to Great Britain and France in 1873 being 32,000 tons. The zinc and iron ores amounted to 496,000 tons. In 1873, C. was seized by a communal junta, but was retaken by the national forces in 1874. Pop. of town and suburbs 1877, 75,908. C., which was a colony of the Carthaginians, was built by Hasdrubal 242 B.C., under the name of New Cartage. It formed the head-quarters of the Carthaginians in Spain, and soon became a city of much wealth and influence. It was captured by P. Scipio in 210 B.C., and became of importance under the Romans, who are said to have employed 40,000 men daily in the mines in the neighborhood. It was sacked by the Goths, and did not again attain any note until the time of Philip II.

CARTA'GO, a city in the state of Cauca, United States of Colombia, 130 m. n.w. of Bogota. It is in a salubrious and well cultivated region, and has a considerable trade in cotton, fruits, coffee, cocoa, and tobacco. Pop. 8,000.

CARTE, THOMAS, an English historian, distinguished for his industry and research, was b. at Clifton, in Warwickshire, where his father was parish minister, in 1686. Educated at Oxford, he afterwards took the degree of M.A. at Cambridge, and entering holy orders, was appointed reader at the Abbey church, Bath; but being attached to the Stuarts, he resigned his office rather than take the oaths to the new government. In 1722, he was suspected of having been concerned in the conspiracy of bishop Atterbury, whose secretary he was, and £1000 was offered for his apprehension; but he escaped to France, where he remained for some years. On his return to England, he published a life of the duke of Ormond, remarkable for the fullness of its information. In 1747–55, he published a *History of England,* bringing it down to the year 1654. This work is very valuable for its facts, but the author had not the capacity to grapple with these philosophically. Hume and other historians, however, have been much indebted to him for the materials of history. Among his other works was an edition of *Thuanus;* and at his death, in 1754, he left behind him 20 folio and 15 quarto volumes of MSS., in further illustration of the history of England to 1688, which have proved of great utility to subsequent writers. These are preserved in the Bodleian library, Oxford.

CARTEL, during a time of war, is an agreement between the belligerents for an exchange of prisoners. Sometimes the name is given to a ship, called by the French a *bâtiment parlementaire,* commissioned to convey the exchanged prisoners, or to carry messages to the enemy. A ship, when thus employed, must carry no cargo, ammunition, or implement of war, except one gun for signals.

CARTER, a co. in n.e. Kentucky, on Little Sandy river; 500 sq.m.; pop.'80, 12,345—371 colored. It has a rough surface, but near the streams the soil is good. The main business is agriculture. Co. seat, Grayson.

CARTER, a co. in s.e. Missouri, on Current river; 500 sq.m.; pop. '80, 2168. The surface is hilly and well wooded; productions, grain and tobacco. Copper and iron are found. Co. seat, Van Buren.

CARTER, a co. in n.e. Tennessee, on the North Carolina border, in the highest part of the state, watered by the Wautauga, Doe, and affluents of Holston rivers; 350 sq.m.; pop. '80, 10,019—634 colored. A branch of the East Tennessee, Virginia, and Georgia railroad traverses the county. There are rich iron mines, but agriculture is the chief business. Co. seat, Elizabethtown.

CARTER, ELIZABETH, an English lady, remarkable for her classical attainments, and also for her knowledge of modern languages, was b. Dec., 1717, at Deal, Kent. Slow at first to learn, she afterwards displayed remarkable aptitude. In her 21st year she published a small volume of poems, and in the succeeding year she translated from the Italian of Algarotti *An Explanation of Newton's Philosophy for the Use of Ladies.* These publications brought her into note, and obtained for her the friendship of such men as bishop Butler, archbishop Secker, sir Joshua Reynolds, Burke, and Dr. Johnson, the latter of whom especially held her in great esteem, and had the highest opinion of her proficiency as a Greek scholar. A translation of Epictetus which she made, was most favorably received by the literary press of her time, both at home and abroad. She died unmarried, Feb., 1806, at the age of 89.

CAR'TERET, a co. in e. North Carolina, on Pamlico sound and the Atlantic ocean, traversed by the Atlantic and North Carolina railroad; 450 sq.m.; pop. '80, 9785—2678 colored. Much of the surface is occupied by swamps and pine forests. Productions mainly agricultural. Co. seat, Beaufort.

CARTERET, JOHN, Earl GRANVILLE, a distinguished orator and statesman of the 18th c., was b. April, 1690, his father being baron Carteret of Hawnes, Bedfordshire. His education, commenced at Westminster school, was completed at Oxford. From the latter

place, according to dean Swift's humorous assertion, he carried away more Greek, Latin, and philosophy than was at all becoming a person of such high rank. Introduced into the house of peers in 1711, he spoke in favor of the Protestant succession, and in consequence received the early notice of George I., and obtained some lucrative appointments. In 1718–19, he was appointed ambassador extraordinary to Sweden, and in the following year succeeded in concluding a peace between Sweden, Prussia, and Hanover. In 1721, he was appointed secretary of state, and in this capacity defended with great zeal the proceedings of government in the Atterbury conspiracy. In 1724, he was made lord lieutenant of Ireland. During his vice-regency, he was in constant intercourse, and held frequent discussion, with dean Swift about public affairs. His lord lieutenancy, which lasted from 1724 to 1726, and again from 1729 to 1730, was popular, particularly the latter period. From 1730 to 1742, he was one of the most able and determined of the leaders of the opposition in the house of lords against sir Robert Walpole, and on his displacement, was made a secretary of state. On the death of his mother, in 1744, he succeeded to the title of earl Granville, and in the same year had to resign his seals of office, the Broad-bottom administration (q.v.) expressly excluding him; but he continued to receive marks of the royal favor. C. was a most liberal patron of men of letters. He died Jan., 1763.

CAR'TERET, PHILIP, an English naval officer who commanded the *Swallow* on a voyage of discovery in the South seas in 1766–69. He was gone 2½ years, and made some discoveries, among them an island to which he gave his name.

CARTE'SIAN PHILOSOPHY. See DESCARTES, *ante*.

CARTHAGE, a city in s.w. Missouri, in the lead regions, on the line of the Memphis, Carthage and Northwest railroad, 220 m. s.w. of Jefferson City; pop. about 300. On July 5, 1861, a force of confederates under gen. Jackson and gen. Price, consisting of about 3,500 men, while retreating from the main army of gen. Lyon, were, at a point about 7 m. e. of Carthage, confronted by gen. Sigel with about 1500 union troops. Gen. Sigel, being superior in artillery, gave battle, which continued several hours with much loss to the confederates, when, to prevent the confederate cavalry from outflanking him and to protect his baggage train, gen. Sigel fell back in good order, and continued his retreat to Carthage and Sarcoxie, 15 miles to the east. The union loss was 50 in killed and wounded, that of the confederates was reported to be 50 killed and about 150 wounded.

CARTHAGE, called *Carthāgo* by the Romans, *Carchēdon* by the Greeks, both of which are but forms of the native name *Karth-hadtha*, i.e., "New Town" (found on ancient coins), was the greatest city of antiquity on the n. coast of Africa, and was situated in what now constitutes the state of Tunis, on a peninsula extending into a small bay of the Mediterranean sea. It was founded, according to legend, by Dido (q.v.), a Phenician queen, who had fled from Tyre after the murder of her husband, almost nine centuries before the Christian era, but more probably (like the Anglo-Indian Calcutta) it originated in an emporium or *factory* established by the colonial merchants of Utica, and the capitalists of the mother-city Tyre, on account of the convenience of its situation. Unfortunately, we know very little of its growth. Our information only begins after C. had become one of the greatest commercial cities of the world, and we have but very scanty and one-sided accounts of it even then. The number of the inhabitants before its destruction amounted to about 700,000. The population was partly of Phenician, partly of Libyan descent. The territory which the Carthaginians acquired by the subjugation of the Libyan tribes, and by the ultimate annexation of other older Phenician colonies, with which they had at first been simply in alliance, such as Utica, Hadrumetum, Tunis, Hippo, the two Leptes, etc., extended in the middle of the 5th c. B.C. southward to lake Triton, eastward to the Great Syrtis, and westward to Hipporegius (now Bona). The maritime power of the Carthaginians enabled them also to extend their settlements and conquests to the other coasts of the Mediterranean. In the 6th c. B.C., they were masters of Sardinia, and had begun to contend for the possession of Sicily. Hanno (q.v.) founded colonies on the w. coast of Africa beyond the straits of Gibraltar, and Himilco visited the coasts of Spain and Gaul. The relations of C. to foreign states in earlier times are not very clear. The first treaty with the Romans was concluded in 509 B.C.; the second, in 348 B.C.; the third, in 306 B.C. The connected history of C. begins with the 5th c. B.C., a period of wars between the Carthaginians and the Greeks in Sicily. The Carthaginian army under Hamilcar was destroyed by Gelon at Himera in 480 B.C. It was not till 410 B.C. that the war began which ended in the conquest by the Carthaginians of some parts of the island. Dionysius the elder, or rather the pestilence working for him, put a stop to their conquests, but did not succeed in expelling them. War raged almost constantly between Dionysius and the Carthaginians. The more feeble reign of Dionysius the younger afforded them an opportunity of extending their conquests, yet they were frequently repelled and defeated by the Sicilian Grecks; and during 311–301 B.C., Agathocles carried the war into Africa, and attacked C. itself. After his death, the Carthaginians again increased their dominions in Sicily, and although Pyrrhus contended successfully against them at first, he left that island entirely in 275 B.C. The subjugation of the s. of Italy by the Romans, brought the two great and conquering nations into collision, and the first Punic war arose, 264 B.C., and after

a great naval victory of the Romans, terminated in 241, the Carthaginians giving up Sicily, Sardinia, and Corsica, and paying to the Romans a large sum of money. Soon after this, a mutiny of the hired troops of C., combined with an insurrection of the Libyan tribes, the ancient inhabitants of the country, who were kept down by the arbitrary rule of the Carthaginian colonists, threatened the entire ruin of the city. Hamilcar brought that bloody war, however, to a successful termination, and led an army to Spain, where he, and after him Hasdrubal, obtained great successes. Here was founded New C., now Cartagena (q.v.). After Hasdrubal's death, 221 B.C., Hannibal (q.v.), burning to revenge the defeat which his native city had sustained from the Romans, broke the treaty with them, and took Saguntum, 219 B.C. Thus began the second Punic war, in which Hannibal pursued his career of conquest from Spain, through Gaul, and across the Alps into Italy itself, defeated the Romans with terrible slaughter in various battles, and, by that of Cannæ in particular, brought Rome to the very brink of ruin. Yet the war terminated in the total defeat of the Carthaginians by Publius Cornelius Scipio, who overthrew their power in Spain, and was victorious over Hannibal in the final and decisive battle of Zama, in Africa, in Oct., 202. A peace was then concluded, in which the Carthaginians were limited to their African territories; but most of their ships of war and war-elephants were taken from them, besides an immense sum of money, and they were taken bound not to make war without permission of the Romans. Massinissa, king of Numidia, skillfully availed himself of dissensions which arose within C. between the nobles and the people, to advance his own interests at the expense of the Carthaginians; and as they (151 B.C.) opposed him, and drove his adherents out of the city, the Romans seized the opportunity for a new declaration of war, 149 B.C., on the ground that the treaty was broken; and after a siege of two years, C. was taken by Publius Cornelius Scipio Æmilianus, 146 B.C. For six days the combat was maintained in the streets of the city, and for seventeen days the work of its destruction by fire was carried on by the conquerors. The country became a Roman province. C. Gracchus sent out 6,000 colonists to found a new city on the site of Carthage. It was called Junonia, but it did not prosper. Augustus, carrying out the intention of his great uncle, restored the city, and the new C. had become, in the second and third centuries of the Christian era, one of the finest cities of the Roman empire. In 439 A.D., Genseric made it the capital of the Vandal kingdom; Belisarius conquered it in 533, and named it Justiniana; the Arabs under Hassan utterly destroyed it in 647 A.D.; and now only two or three small hamlets and a few ruins mark its site.

We have not very satisfactory accounts of the constitution of the Carthaginian state. It is certain that it was oligarchical, and that the chief power was in the hands of the great families (gentes), from whose members the senate, amounting to 300, was chosen. This senate appointed, as it were, a more select council of 30, and sometimes a still smaller one of only 10, at the head of whom were two *suffetes* (probably the same as the Hebrew *shofetem*, "judges"), but it is not certain what relation these bore to one another, or how their power was apportioned between them. We can gather dimly, from various scattered statements, that the Carthaginian oligarchy, while despising the multitude, was itself split up into factions, and torn by family jealousies. Corruption largely prevailed; and it would perhaps have been better for the country if the power had been in the hands of a popular despot than of a band of insolent and tyrannical nobles.

The Carthaginian army was raised from the conscription of the subjugated Libyans, from the hired Numidians, and from slaves. In the time of Agathocles, the city sent forth 40,000 heavy armed infantry, 1,000 cavalry, and 2,000 war-chariots, but the state could easily raise 100,000 troops. The fleet in the first Punic war consisted of 350 ships, carrying 150,000 men. How C. contrived to raise revenues sufficient to cover the enormous expense her military and naval organization involved, is not very clear. It was, in all likelihood, derived from tribute imposed on subject Libyan or Numidian races, in great part from mines in Spain, and from import duties derived from her maritime and inland trade, which was prodigiously great. Her merchantmen visited every coast and island of the Mediterranean, and even ventured as far as the Azores, Britain, the Baltic, etc.; while her caravans penetrated through Sahara to the gold-producing districts of the Niger, and through the Libyan desert to the lands along the Nile.

The religion of the Carthaginians appears to have been substantially the same as that of the Phenicians—a worship of the stars and of fire. Moloch was the chief deity, and to him children and captives were sacrificed. The highest natural manifestation of this deity was the sun. Besides Moloch, the Carthaginians worshiped the Tyrian Hercules; Astarte, the goddess of the elements; Esmun, the god of the celestial vault; and a variety of heros, heroines, and genii or spirits, such as the Genius of Death, Hamilcar (who fell at the battle of Himera), Dido, the brothers Philæni, etc., as well as a few of the lesser Greek divinities, of whom a knowledge had been obtained in Sicily. It does not appear that there was a distinct sacerdotal order in Carthage. Probably religious ceremonies were performed by the dignitaries of the state, but our knowledge on this interesting point is too meager to permit of our arriving at any very definite conclusion.

CARTHAGE, a headland of n. Africa, jutting out into the Mediterranean, in lat. 36° 52′ n., lon. 10° 22′ east. Traces of the ancient city of Carthage (q.v.) are found on it to the n. of the Tunis lagoon.

CARTHAGE'NA, capital of the state of Bolivar, one of the United States of Colombia. It stands on the Caribbean sea, a little to the s.w. of the mouth of the Magdalena, in lat. 10° 26′ n., long. 77° 54′ w., having the best harbor on the coast, with a naval arsenal and strong fortifications. Its population is estimated at 10,000, not more than one-tenth being white. The temperature ranges from 80° to 86° F.—the air, however, being dry and healthy. In the history of Spanish America, and more especially in that of the war of independence, the city occupies a prominent place.

CARTHAGE'NA (*ante*), a fortified seaport of the United States of Colombia, founded by the Spaniards, 1508. The city is noted for its fortifications, convent buildings, and fine harbor. The walls and defenses were completed in 1717, at a cost of $59,000,000. In 1585, C. was sacked by the English under sir Francis Drake, and in 1741, besieged by the fleet of admiral Vernon. In 1860, gen. Mosquera abolished the convent system, allowing priests and nuns but 48 hours to leave the city. The climate is dry and hot, but salubrious, although C. has been ravaged at intervals by yellow fever. There is a small export of caoutchouc, tobacco, hides, and other interior products. The population, which in 1800 was about 25,000, is now reduced to 3,000.

CARTHAGENA BARK. See CINCHONA.

CARTHA'GO, a term of various application in Central America.—1. An almost land-locked bay or lagoon of the Caribbean sea, near the n.w. extremity of the Mosquito shore.—2. A river entering the same from the s.s.w., about lat. 15° n., and long. 84° west. —3. A river of Costa Rica, flowing into the gulf of Nicoya, an inlet of the Pacific, near lat. 9° 36′ n., and long. 84° 30′ w.—4. A city, or rather the ruins of one, on the same, about 60 m. from its mouth. Down to 1841, it was the capital of Costa Rica; but being in that year all but destroyed by an earthquake, it was supplanted by San José, previously its superior in wealth and importance, about 15 m. to the w.n.w. of itself. The volcano of its own name, doubtless connected with its overthrow, is valuable as a landmark to mariners.

CARTHA'GO NOVA. See CARTAGENA, *ante.*

CARTHAMINE, or CARTHAMEINE. The dye so called is obtained by a chemical process from safflower (q.v.), (*carthamus tinctorius*) in crystals which are insoluble in water, but slightly soluble in alcohol and ether. When newly precipitated, C. immediately and permanently attaches itself to cotton or silk, but not to wool, requiring no mordant, dyeing the fabric a fine red, which is changed to yellow on the addition of alkalies, and may be returned to red again on being treated with acids.

CARTHUSIANS, a monastic order which owes its origin to St. Bruno, who retired in 1086 with six companions to the solitude of La Chartreuse (whence the name), near Grenoble, where they built hermitages, wore rude garments, and lived upon vegetables and coarse bread. In 1134, the fifth prior, Guigo, composed a body of rules, called the *Statuta Guigonis* or *Consuetudines Cartusiæ*, but they have been often changed. After 1170, when the order received papal approbation, it extended rapidly. It dates from 1180 in England, where the name of Chartreuse-houses was corrupted into charter-houses. The C. were divided into two classes, fathers (*patres*) and brothers (*conversi*). Each occupied a separate cell, with a bed of straw, a pillow, a woolen coverlet, and the means of manual labor or of writing. They left their cell, even for meals, only on festivals and on days of the funeral of a brother of the order. Thrice a week, they fasted on bread, water, and salt, and there were several lengthened fasts in the year. Flesh was forbidden at all times, and wine, unless mixed with water. Unbroken silence, except on rare occasions, was enforced, as well as frequent prayer and night-watching. These austerities were continued, with little modification, by the modern Carthusians. The order at one time counted 16 provinces, and can still boast some of the most magnificent convents in the world—as *La Grande Chartreuse*, near Grenoble, and *Certosa*, near Pavia. They were given to hospitality and works of charity, and were on the whole better educated than the mendicant orders. Their principal seats were in Italy, France, and Switzerland; but they have shared the fate of the other monastic establishments, and their convents are now for the most part solitudes indeed. The Carthusian nuns arose at Salette, on the Rhone, in France, about 1229. They followed the rules of the Carthusian monks, but with some mitigations, of which the most notable is that they have a common refectory.

CARTIER, Sir GEORGE ÉTIENNE, 1814–73; a laywer of Canada, educated at St. Sulpice, Montreal. He was one of the Papineau "rebels" in the abortive revolution of 1837–38, but was forgiven; and became a member of the provincial legislature, secretary, and attorney-general. In 1858, he became premier. He was instrumental in abolishing feudal tenure in Lower Canada, in making the legislative council elective, in codifying the laws, in decentralizing the judiciary, and in bringing about the confederation of the colonies.

CARTIER, JACQUES, b. 1494, in Brittany. In 1534, he sailed from St. Malo in command of two ships to explore the n.e. coast of America. He touched at cape Buenavista, Newfoundland, passed up the straits of Belle Isle and discovered the mainland of Canada, which he claimed for France. The next year, with another expedition, he sailed up the St. Lawrence as far as Hochelaga, a large fortified native village at the foot of a

hill, which he named Mont Royal (now Montreal). Disgusted with the severe climate, and his men being sick with scurvy, he went back to France in 1536, and nothing was done towards colonization until 1540, when Jean Francis de la Roche, sieur de Roberval, obtained leave to form a settlement. In 1541, Cartier was sent out in command of five ships, and near the present Quebec he built a fort and named it Charlesbourg; but the Indians, whose chief he had carried off in his previous voyage, gave him so much trouble that he returned to France. Cartier appears no more in public life except as seigneur of his native village of Limoilin, where he was living as late as 1552.

CARTILAGE is a firm elastic substance, of a pearly whiteness, presenting to an unaided eye a uniform and homogeneous appearance. Cartilages may be divided into the *temporary*, the *permanent*, and the *accidental*. The *temporary* cartilages are substitutes for bone in the earlier periods of life, and after a certain time become ossified. See Osteology. At birth the extremities and larger eminences of the long bones, and the margins of the flat bones are still cartilaginous, and this C. does not altogether disappear till the period of puberty. The *permanent* cartilages are either *articular* or *non-articular*. *Articular* cartilages are attached to the extremities of bones, and enter into the formations of joints. *Non-articular* cartilages are usually more flexible than the articular. They are sometimes attached to bones, to lengthen them out, as, for instance, in the nose, the auditory canal, and the Eustachian tube. See Hearing, Organs of. In other cases they form the basis of distinct organs, as the larynx, the trachea, and the eyelids. *Accidental* cartilages are cartilaginous concretions, which are occasionally found in situations where they do not normally occur, and are of no general interest. The physical properties of cartilages, especially their elasticity, resisting power, and incapability of extension, are such as to fit them admirably for the functions which they have to perform in the animal economy. A brief notice of the microscopical characters of C. will be found in the article Cells, and a reference to its chemical composition will be found in the articles Gelatinous Tissues and Gluten.

CARTILAGINOUS FISHES are those fishes which have a skeleton destitute of bony fibers. In some of these fishes, the skeleton is merely rudimentary, so that they seem to form an intermediate link between vertebrate and invertebrate animals. In the lancelets (q.v.), (*amphioxus*), it consists of nothing more than a slender, transparent, flexible dorsal column; in *myxine* also it is a soft flexible tube, without appearance of vertebræ or of ribs; in the lampreys, the dorsal column is still a mere cylinder of cartilage, without any notable division into segments; whilst even in the sturgeon, the center of the backbone is a continuous gelatinous cord, and in the sharks the vertebræ are formed of hollow cones, meeting at their apexes in the middle, and having their cups filled with the remains of the gelatinous cord, an arrangement from which result great elasticity and flexibility. In many instances, even in the higher C. F., several vertebræ are united in a single piece; in all of them the skull is formed of a single piece without sutures, although the general form agrees with that of the skull of other fishes, and the same parts or regions may be recognized. The calcareous matter present in the skeleton is always deposited in a granular manner, giving a characteristic dotted appearance; but even in the skull of the basking shark, one of the most highly organized, the earthy matter has been found to form little more than 3 per cent of the whole substance; in the skeleton of the lamprey, it is only 1½ per cent. In other parts of their organization, C. F. differ from each other very widely; some of them possessing the organs of the senses in as great perfection as any fishes whatever, whilst in others these organs are very imperfectly developed. Linnæus placed the C. F. along with batrachian reptiles in his class *amphibia*. By the general consent of naturalists, however, they are placed in the class of fishes. Cuvier, referring to the very different degrees of organization which they exhibit, says "they form a series ranging parallel to the bony fishes just as the marsupial mammalia range parallel with the other ordinary mammalia." Owen and others, admitting the justice of this view, have, however, pointed out in the C. F. generally, characters corresponding with those of the osseous fishes in their embryotic state, and with the permanent or mature conditions which prevailed among the fishes of some of the older geological periods. One remarkable characteristic even of the higher groups of C. F.—sturgeons, sharks, rays, etc.—is the *heterocercal* tail, the vertebral column being prolonged into the upper portion of the caudal fin, and the lower one given off on its under side, as in the fossil fishes generally of the old red sandstone and other oldest fish-producing rocks. Cuvier divided C. F., or *chondropterygii* (Gr. cartilage-finned) into 3 orders: *sturiones* (sturgeon, chimera, etc.), having the gills free, and gill-openings with a lid, like the osseous fishes; *selachii* (sharks and rays), having the gills fixed, and consisting of folds of membrane on a plane surface, with numerous gill-openings, the jaws movable as in other fishes generally; and *cyclostomi* (lampreys, etc.), also having fixed gills and numerous gill-openings, the mouth adapted for sucking. Müller and Owen, however, separate the *cyclostomi* of Cuvier from the other C. F., on account of important anatomical differences, particularly in the structure of the heart, which in the *cyclostomi* wants the *bulbus arteriosus*, or thick muscular swelling of the commencement of the arterial system close to the ventricle; whilst this, which may, in fact, be considered as a third chamber of the heart, is present in the *sturiones* and *selachii*, and within it, are 3 or more longitudinal rows of valves; characters derived from the vascular system being

deemed by these great naturalists of the highest value in determining the arrangement of the class of fishes. The lancelets occupy a place by themselves, from their absolutely wanting a heart, and having the circulation carried on by the muscularity of the entire vascular system.

CARTOON (Ital. *cartone*, pasteboard; from Lat. *charta*, paper). In the fine arts, C. is a design on strong paper, of the full size of a work to be afterwards executed either in fresco, oil color, or tapestry. The object of the artist in preparing a C. is, that he may adjust the drawing and composition of his subject in circumstances in which alterations can be effected with facility, before proceeding to the execution of the work itself. Cartoons are generally composed of a number of sheets of stout paper or pasteboard, pasted together at the edges, and stretched on a frame. The surface is sometimes *primed*, or washed with a ground-color; but more frequently this process is dispensed with. The drawing is made either in chalks or in *distemper* (q.v.), in which latter case the C. itself has very much the appearance of a fresco. Frequently only two colors are used, merely for the purpose of producing light and shade, in which case the C. is said to be *in chiaro-oscuro*. The C., when finished, is transferred to the canvas or plaster on which the work is to be executed, either by tracing with a hard point, or by pricking with pins, charcoal in both cases being used. Sometimes lines are simply drawn across it, or, if it is wished to preserve it from injury, threads are stretched across it from pins placed at the required distances along the edges. In *fresco* painting (q.v.), the plaster on which the work is executed must be kept wet, in order that it may absorb the color, and consequently only a small portion can be executed at a time. For this reason, the C. must be traced in small compartments of the size that the artist can finish without stopping. It is here, consequently, above all, that the necessity for the previous execution of a C. is greatest, as it would be impossible to sketch the whole design on the plaster in the first instance. But the great masters used such studies in *chiaro-oscuro* as guides to them in almost all their more extensive works, and many of these monuments of their care, as well as of their genius, have been preserved. We have cartoons of Andrea Mantegna, Domenichino, the Caracci, etc.; but the finest specimens of cartoons in existence are those of Raphael at Hampton court. These marvelous conceptions were sent to Flanders in the reign of Leo X., in order that they might be copied in tapestry in two sets, one of which was designed for the pope, the other for a present by the pope to Henry VIII. of England. The tapestries, which are very inferior to the designs, are still in existence. One set is in Rome, the other was in England till the death of Charles I., when it was purchased by the Spanish ambassador and carried to Spain. At a recent period it was brought to London and offered for sale, but as no English purchaser was found, it was again carried to the continent. For many years the cartoons, originally twenty-five in number, lay neglected at Brussels, and many of them were destroyed. The seven now at Hampton court were at length purchased by Rubens for King Charles I. It is an instance of Cromwell's good sense, in a direction in which it was not often exhibited, that at the dispersion of the royal collections, these cartoons were purchased for the nation by his special command. So low was the artistical taste of the time, however, that whilst the "Triumph of Julius Cæsar," by Andrea Mantegna, still at Hampton court, was valued at £2,000, the cartoons of Raphael were set down at £300! In Charles II.'s time, these remarkable works were again consigned to oblivion. An attempt was made to have them copied in tapestry, by which they were seriously injured. William III., strangely enough, followed in Cromwell's footsteps in appreciating what Charles II. had neglected. He had the cartoons restored, and built a gallery for them at Hampton court, where, with the exception of a visit to Windsor in George III.'s time, they have since sojourned. The following are the subjects represented: 1. Paul Preaching at Athens; 2. The Death of Ananias; 3. Elymas, the Sorcerer, struck with Blindness; 4. Christ Delivering the Keys to Peter; 5. The Sacrifice at Lystra; 6. The Apostles Healing the Sick at the "Beautiful Gate" of the Temple; 7. The Miraculous Draught of Fishes. Our space and our design equally preclude us from attempting any statement of the merits of these exquisite compositions. Several of the lost cartoons are partially transmitted to us by engravings, some of which were executed from the tapestries; others, it is believed, from the originals. The subjects of these are—1. The Adoration of the Kings; 2. Christ appearing to Mary Magdalene; 3. The Disciples at Emmaus; 4. The Murder of the Innocents; 5. The Ascension. These were engraved, along with the others, by Somereau, a French engraver, in 4to. Other cartoons of Raphael exist—one the property of the duke of Buccleuch, and two in the possession of the king of Italy, which are said to have belonged to the set sent to Flanders. There is also a portion of one in the national gallery in London, but it is now painted over with oil color. The best engravings of the cartoons at Hampton court are by Dorigny, Audran, and Holloway; but in future it is probable that they will be more known to the public by means of photographs, of which Messrs. Colnaghi and others have already produced very beautiful specimens.

CARTOUCH is a word much used in the French military service, but less frequently in the English. The name was once given to a wooden case containing 200 to 300 musket-bullets, and 8 or 10 1-lb. balls, fired from a mortar or howitzer in defense of a

ditch or intrenchment; but such missiles have been superseded by others. The cartridge-box carried by the soldiers used to be called a C. in England, and still is in France.

CARTOUCHE, the name by which the French, and we after them, designate the ovals on which the hieroglyphic characters for the names of Egyptian kings are sculptured. See CAVO-RILIEVO. C. is also used to signify a tablet, either for ornament or to receive an inscription, so formed as to resemble a sheet of paper or parchment, with the edges and ends rolled up. Cartouches are often seen on tombs. The same term is sometimes applied to modillions, or brackets supporting a cornice.

CARTOUCHE, LOUIS DOMINIQUE, 1693–1721; the leader of a band of robbers and assassins in France, whose crimes created great terror in Paris. For many years he eluded the police, but at last was arrested by chance in a low drinking-house. He had a long trial, which created a great deal of interest, and was finally sentenced to death, and broken on the wheel before an immense assembly of approving spectators.

CARTRIDGE is a cylindrical case made to contain either the whole or a part of the materials for discharging from a fire-arm. Those for ordnance or large guns are chiefly made of serge and flannel, sewn up into the form of a bag, which, supplied with a given weight of powder, is tied round the neck, and strengthened by iron hoops. The weight of powder varies from about 300 lbs. for an 81-ton gun, to a few ounces for a mountain gun.

Cartridges for small-arms which load at the muzzle are usually paper tubes, containing a leaden ball and a few drachms of powder. The tubes are made in such a way that the powder has two or three thicknesses of paper around it, while at the mouth of the tube and over the bullet there is only one. The paper over the bullet is lubricated generally with a composition of beeswax and tallow. In loading, the paper at the mouth of the tube has to be twisted or bitten off; the powder is then poured into the barrel, the tube reversed, and the bullet inserted into the muzzle, and the tube broken away. Cartridges for breech-loading small-arms are generally formed of a thin sheet of brass coiled into a cylinder, and having an iron case, in the center of which is the percussion arrangement. Those used for the Snider and the Martini-Henry rifles are described in the article on BREECH-LOADING ARMS. Besides the C. case of coiled brass, there are others made of solid brass or copper (an American invention), and these seem to be gaining favor abroad, the Prussians having adopted such a case for the new Mauser rifle.

For muzzle-loading shot guns, the chief cartridges used contain a charge of shot packed in a paper cylinder of a size suitable for the bore of the gun. Some of these, in addition to the paper covering, are surrounded with a wire net-work, for the purpose of increasing the range and penetration.

The C. for breech-loading shot guns is usually a stout cylinder of paper with a metal case. They are made of various sizes to suit the different calibers of guns, and with pin or central fire ignition. In the pin-fire C., a small brass pin passes through the side of the case into the percussion cap, and protrudes through a small hole in the top of the barrels. The pin is struck by the hammer of the gun, and forced into the percussion cap, which explodes, and ignites the powder. In the central-fire C., the cap is in the center of the case, and is exploded by the hammer of the gun acting on a piston contained in the false breech.

In America, a solid brass C. case is often used for shot guns.

For sporting rifles, the cartridges are quite as numerous and as varied as for shot guns. With large-bore rifles the same C. case is generally used as for shot guns, but loaded with powder and ball (spherical, solid conical, hollow conical, or shell). For small-bore, or what are known as express rifles, either a coiled brass C. case, similar in construction to that for the Snider or Martini-Henry rifle, but made to contain a larger charge, or a solid brass case is used. The coiled case can be reloaded twice or thrice, while the solid case can be reloaded as often as twenty times, and on this account the latter is rapidly gaining favor with sportsmen in India and Africa. The express C. contains a very heavy charge of powder, with a light hollow conical bullet giving very great velocity, low trajectory, and immense killing power. In the Henry express C., the charge of powder is 4 drachms, while the bullet weighs only 270 grains.

Cartridges for breech-loading pistols and revolvers are generally small metal cylinders containing a charge of powder and a bullet, and with rim, pin, or central fire ignition, the diameter varying from .230 of an inch upwards.

CARTRIDGE-PAPER, a light-colored strong paper, originally manufactured for soldiers' cartridges (q.v.), is extensively used in art, its rough surface being useful for certain kinds of drawing.

CARTWRIGHT, EDMUND, celebrated on account of his invention of the power-loom, was b. April 24, 1743, at Marnham, Nottinghamshire. Educated at Oxford, he obtained a living in the English church, and devoted himself exclusively to his ministerial duties and to literature, until a casual conversation, in 1784, directed his attention to machinery, and in 1785 he exhibited his first power-loom (q.v.) in action, an ingenious though very rude machine; upon which, however, he subsequently effected improvements rendering it almost perfect. Its introduction was vehemently opposed, and a mill fitted up with

500 of his looms was ignorantly and maliciously burned down. C., in 1790, took out a patent for combing wool, and secured patents for various other improvements in connection with manufactures. But his patents yielded him little return, and, in 1809, government, in consideration of his inventions, granted him £10,000. C. was the author of a legendary poem, entitled *Arminia and Elvira*, and other poetical pieces. He died Oct., 1823.

CARTWRIGHT, John, 1740–1824; usually called maj. C.; in the English navy in his youth. He was present at the capture of Cherbourg, and subsequently on the Newfoundland station, when he was appointed chief magistrate of the settlement, discharging the duties of the office with great ability for five years. When the dispute with the American colonies began, he espoused their cause, declining to fight against them, and thereby rejecting an almost certain high military or naval promotion. In 1774, he published *American Independence the Glory and Interest of Great Britain*. The next year he was appointed maj. in the Nottingham militia, which position he served for 17 years, being finally superseded because of his political opinions. In 1776, he appeared in print as the advocate of parliamentary reform, and thenceforth devoted his life to the attainment of universal suffrage and annual parliaments. In 1778, he was an unsuccessful candidate for Nottinghamshire, and the same year founded the "society for constitutional information," a body which embraced many of the distinguished men of the day, and from which organization rose the famous "corresponding society." His work in the furtherance of reform was incessant. In 1819, he was indicted for conspiracy, found guilty the following year, and sentenced to pay a fine of £100. He spent his last years in London. He was married, but left no children. In 1831, a monument to him was erected on Burton Crescent.

CARTWRIGHT, Peter, d.d., 1785–1872; a native of Virginia; settled in early life in Kentucky, where, in 1806, he was ordained a deacon in the Methodist Episcopal church. He was subsequently regular preacher and presiding elder, and a member of every quadrennial conference from 1816 to 1860, and once more in 1868. He was a zealous worker, in the course of 33 years preaching about 15,000 sermons, and baptizing 12,000 converts. C. was widely known for his homely but powerful preaching; and interesting stories are told of his daring and romantic adventures among the rough backwoodsmen. Many of these can be found in his *Fifty Years a Presiding Elder*, and in the *Autobiography of Peter Cartwright, the Backwoods Preacher*.

CARTWRIGHT, Samuel A., b. Va., 1793; d. about 1863. He studied medicine under Dr. Rush and graduated at Pennsylvania college. During Jackson's campaigns against the Indians and the British he was surgeon-in-chief, and, after 1815, settled in Alabama and afterward in Natchez, Miss., where he labored for a quarter of a century. Dr. C. wrote many valuable papers upon fevers, cholera, and other diseases.

CARTWRIGHT, Thomas, a distinguished Puritan divine of the 16th c., was b. in Hertfordshire, about 1535. He studied at Cambridge, where, in 1570, he was chosen Margaret divinity professor. His lectures here were too honestly critical of the polity of the church to be acceptable to the chief authorities, who deprived him of his professorship, and subsequently of his fellowship. C. traveled on the continent, and made the friendship of such men as Beza, who, in a letter concerning him, says, "I think the sun doth not see a more learned man." On his return to England, he again became embroiled with the church and the government, and for his non-conformity suffered imprisonment several times. He died Dec., 1603. He wrote *A Confutation of the Rhemish Translation, Glosses, and Annotations on the New Testament.*

CA'RUS, Karl Gust., a German scholar, physiologist, physician, and artist, was b. at Leipsic, 3d Jan., 1789. He first attracted notice by a series of lectures on comparative anatomy, delivered in his native city about the year 1812. After having superintended, during the war of 1813, the French hospital at Pfaffendorf, he went to Dresden, where he was appointed professor of midwifery in the newly organized medico-chirurgical academy, but resigned his office when elected court physician and councilor of state. His house was the rendezvous of all the most distinguished savants and artists in Dresden. C. wrote a vast variety of works, some of which are marked by original and striking views, as, for instance, *Ueber den Kreislauf des Blutes der Insecten*, in which he demonstrates the circulation of the blood in insects. He died in July, 1869.

CA'RUS, Marcus Aurelius, 222–83; Emperor of Rome; supposed to have been the son of a noble Roman lady and an African father. On the assassination of Probus in 282, C. was proclaimed emperor by the legions. He was victorious over the Sarmatians, and in a winter campaign in Asia, he carried his arms beyond the Tigris. He died very suddenly in camp, and it was given out that he had been struck with lightning.

CARVAHAL', or CARBAJAL, Tomas José Gonsalez, 1753–1834; poet and statesman of Spain; educated at Seville. He held a number of offices of importance, and in 1812, became director of the university of San Isidore, where, by establishing a chair of international law he offended the government, and was imprisoned for 5 years. He was reinstated by the revolution of 1820, but forced into exile by the counter-revolution 3 years later. He died a member of the supreme council of war. C. obtained celebrity as the author

of metrical translations of the poetical books of the Bible, and for other works in prose and verse.

CARVAL'HO E MELLO. See POMBAL, *ante.*

CARVEL-BUILT. The difference between the *carvel* and the *clincher* methods of arranging the outer planks in ship and boat building is explained under CLINCHER-BUILT.

CARVER, a co. in s.e. Minnesota, on the Minnesota and Crow rivers; 375 sq.m.; pop. '80, 14,140. Surface undulating, and soil fertile; productions chiefly agricultural. One or two railroads are in operation or in progress. Co. seat, Chaska.

CARVER, JOHN, b. England, d. Massachusetts, 1621. He left England on account of religious intolerance, and settled in Leyden, whence he was sent to effect certain arrangements with the Virginia company. In 1619, he got a patent, and sailed in the *Mayflower* with 101 colonists. On the landing at Plymouth, Carver was chosen as governor, and managed affairs prudently for the four months between his election and his death.

CARVER, JONATHAN, 1732–80; a native of Connecticut; began the study of medicine, but became a soldier, and served in the colonial wars previous to the revolution. After the peace of 1763, and the cession of the Canadas to Great Britain, Carver traveled extensively in the northwestern wilderness, for the purpose of finding new openings for trade, going to England to announce his discoveries. In 1778, he published *Travels through the Interior Parts of North America,* and the next year a treatise on the culture of tobacco. He died in extreme destitution.

CARVIN-EPINOY, a t. of France, dep. of Pas-de-Calais, 11 m. s.s.e. of Lille, and about the same distance by railway. There are manufactures of beet-root sugar, starch, earthenware, and leather. Pop. '76, 6,167.

CARVING, a subordinate branch of sculpture, is usually performed on ivory or wood. Ivory was the favorite material for this purpose in the e. from an early period. Among the Babylonians, who likewise practiced gem-engraving to a great extent, carved heads for staves were executed in vast quantities, as every Babylonian carried a staff and a signet ring. During the palmy days of Grecian art, ivory was largely employed; the nude portion of the colossal statues of the gods being composed of some solid material overlaid with plates of ivory, while the remaining portions were of plate gold. At a later period, ivory was chiefly employed in small works, usually of a decorative character. During the earliest period, statues of the gods were generally of wood, painted, gilt, or draped with colored robes, different kinds of wood being appropriated to different divinities. Carvings in ivory form an important branch of early Christian sculpture. Among the most curious of these are the ivory tablets adorned on the outside with low-reliefs, and in the inside coated with wax for the purpose of writing upon. The chair inlaid with ivory that belonged to archbishop Maximilian in the cathedral at Ravenna, is of this period (546–55). In the year 803, Charlemagne received two richly carved doors as a present from Constantinople, but works of the same kind were executed at a much earlier period. Towards the end of the middle ages, the art of C. in wood was brought to a high degree of perfection in Germany. Altars were adorned with carvings of this material, often of large size, and with numerous figures; in general, the nude portions were carefully and tastefully colored after nature, and the draperies gilt. Specimens are to be seen in the churches at Altenberg, Erfurt, Prague, and in some churches in Pomerania. The finest and most perfect specimens are a series of reliefs relating to the doctrine of transubstantiation in the church at Tribsees. Many of the Belgian churches also possess very beautiful examples of wood-carving. Michael Wohlgemuth of Nuremberg, and after him Veit Stoss, were eminent carvers in wood. The wood-carving on the great altar of the cathedral at Schleswig by Hans Bruggemann belongs to the beginning of the 16th century. Many graceful specimens of wood-carving, on a smaller scale, belonging to this period, are to be seen in museums. Nuremberg was celebrated for its wood-carvings; but only a few of the many works ascribed to him can be assigned with certainty to Albert Dürer. Portrait medallions, usually cut in box, were much in vogue during the early part of the 16th century. The first artist in this line was Hans Schwartz of Augsburg. During the 17th and 18th centuries, we find ivory again extensively employed in crucifixes, crosses, and goblets, with relief representations. The most eminent artist is Franz de Quesnoy.

CARY, ALICE, b. near Cincinnati, O., 1820, d. N. Y., 1871. At the age of 18, she began to write for the press, and at the age of 30, with the assistance of her sister Phœbe, she published a volume of verses which were exceptionally popular. In 1851, the sisters removed to New York city, where, under the friendship and patronage of Horace Greeley, they led successful literary and social lives for 20 years. Among the works of Alice, besides many poems, are *Clovernook; Hagar, a Story of To-Day; Married, not Mated; Pictures of Country Life; Snow Berries; The Bishop's Son; The Lover's Diary,* etc.

CARY, ARCHIBALD, 1730–86; a Virginian, conspicuous on the patriot side of the revolution, his services being mainly in the Virginia convention and house of burgesses.

When the state government was organized he was chosen president of the senate. The story is told of him that, on hearing a report that Patrick Henry was spoken of for dictator, he said to Henry's half-brother, "I am told that your brother wishes to be dictator. Tell him from me that the day of his appointment shall be the day of his death, for he shall find my dagger in his heart before the sunset of that day." Patrick Henry was the last man in the world to aspire to a dictatorship.

CARY, Rev. Henry Francis, known for his admirable translation of Dante, was b. at Birmingham in 1772. At Oxford, where he entered Christ church as a commoner in 1790, he was early distinguished as a classical scholar, and also for his knowledge of Italian, French, and English literature. In 1805, he translated Dante's *Inferno*, and in 1814, the whole of the *Divina Commedia*, a translation remarkable not only for its accuracy but for its expressiveness and force. He afterwards translated Pindar's *Odes* and Aristophanes's *Birds*, and wrote a series of memoirs, in continuation of Dr. Johnson's *Lives of the Poets*. For some years he held the appointment of assistant-librarian in the British museum, and died in 1844. A memoir by his son was published in 1847.

CARY, Lott, b. a slave in Virginia in 1780, d. in Monrovia, Africa, 1828. Early in life he became a zealous Baptist; redeemed himself and two children from slavery, and in 1821 went to Liberia, where he was concerned in removing the colonists from the unhealthy locality first chosen for their settlement. He did much to advance the welfare of the new republic, and was left in full power when, in 1826, Mr. Ashmun sailed for the United States.

CARY, Phœbe, 1824–71; sister of Alice, also a poetical and prose writer. Most of her works were issued with those of Alice. She d. at Newport, R. I., three months after the death of her sister, with whom she was a life-long companion. Neither of them was ever married.

CARY, Sir Robert, son of Henry Cary, lord Hunsdon, was b. in 1559 or 1560, and rose to eminence in the civil service of queen Elizabeth. For a number of years, he acted as English warden on the marches. As a courtier, he was present at the death of Elizabeth, 1603, and expeditiously rode on horseback to Edinburgh to communicate the intelligence to her successor, James VI. At the coronation of Charles I., he was elevated to the peerage as earl of Monmouth. At his death without male issue the earldom became extinct. Sir Robert Cary wrote his *Memoirs* (Edin. 1808), a work interesting chiefly from notices connected with border history.

CARYA. See Hickory.

CARYAT'IDES (pl. of *Caryatis*, literally, a woman of Caryæ), a name given to female figures, in Greek architecture, when applied instead of columns to support a roof. The traditional account of the origin of the name is, that the inhabitants of Caryæ, a city in Arcadia, having joined the Persians after the battle of Thermopylæ, the Greeks, after their victory over the Persians, destroyed the town, slew the men, and carried the women into captivity. As male figures representing Persians were used for this purpose, it occurred to Praxiteles, and other Athenian artists, that female Caryatæ, in their national costume, might be thus employed to commemorate the disgrace of their country. Lessing, and various other writers, have treated this account as fabulous; but it seems to be confirmed by a bass-relief preserved at Naples, in which two female figures are represented in the attitude of C., and which has a Greek inscription mentioning the conquest of Caryæ. Male figures used for the same purpose are called Atlantes (q.v.).

CAR'YL, Joseph, 1602–73; a non-conformist clergyman, a native of London, educated at Oxford. By order of Cromwell, he attended Charles I. in Holmby house, and in 1650, he was sent with Owen to accompany Cromwell to Scotland. He is remembered for a ponderous commentary on the book of Job, in which, after the fashion of his time, he enlarges on every verse, and almost on every word.

CARYO'CAR, a genus of large trees of the natural order *rhizobolaceæ*, and almost constituting the whole order. They are all natives of Guiana and Brazil, and are sometimes called *pekea* trees. They yield good timber for ship-building, and produce the delicious nuts, now not uncommon in the London market, called *butter nuts* or *souari nuts*. The fruit is a sort of drupe, containing several combined nuts. The fleshy part of the drupe consists of a butter-like substance, which melts between the fingers, and is used in cookery instead of butter, on which account these trees are sometimes called *butter-trees*. It forms merely a thin covering for the nuts, the bristles on the outer surface of which, in some of the species, sting like the hairs of the nettle, and are very troublesome to those who open them. The kernels are remarkably soft. An oil is extracted from them which is scarcely inferior to olive oil. *C. nuciferum* is now cultivated in the island of St. Vincent; but *C. butyrosum*, *C. glabrum*, *C. tomentosum*, and other species appear equally worthy of attention.

CARYOPHYLLA'CEÆ, a natural order of exogenous plants, containing upwards of 1000 known species, mostly herbaceous plants, a few half shrubby. The stems are tumid at the articulations; the leaves always opposite and entire, often uniting around the stem. The flowers are regular; the calyx persistent, of 4 to 5 sepals, either free or united into a tube; the corolla of 4 to 5 petals, which are frequently bifid, and generally terminate

in a claw at the base, sometimes wanting; the stamens as many, or twice as many, as the petals; the ovary of 2 to 5 carpels; the stigmas sessile; the fruit is a one-celled capsule, with central placenta, to which the seeds are attached.—The plants of this order are mostly natives of temperate and cold countries; some of them are only found on tropical mountains, near the limits of perpetual snow. Most of them are inconspicuous weeds; some produce beautiful flowers; almost all are insipid and inert; a few contain *saponine*, aed afford a substitute for soap. See SOAPWORT. To this order belong the pink, carnation, sweet william, lychnis, chickweed, etc.

CARYOPHYLLUS. See CLOVES, MYRTACEÆ.

CARYOP'SIS, in botany, a fruit in which the seed and pericarp are so incorporated as to be inseparable, and even undistinguishable. The grain or fruit of grasses, as wheat, barley, rye, maize, etc., is a caryopsis.

CARYO'TA, a genus of palms, natives of the East Indies, one of which, *C. urens*, remarkable for the acridity of its fruit, which produces a burning sensation when its pulp is applied to the skin, is also highly valuable for the great quantity of juice (*toddy*) which flows from its wounded spathes, sometimes, in the hot season, to the amount of 100 pints in 24 hours from a single tree. Sugar (*jaggery*) is made from this juice by boiling it down, and on this account this palm is sometimes called the jaggery palm. The pith of old trees, or farinaceous part of the trunk, is also much used for food, and is said to be equal to the best sago. The outer part of the stem is very hard, and applicable to many purposes. The fibers of the leaf-stalks are made into ropes, which are very strong and durable; the leaf-stalks, merely stripped of the leaflets, are used as fishing-rods, being light, tapering, and elastic; and the woolly substance found at their base is sometimes used for calking ships. This palm is found both in India and Ceylon, and abounds chiefly in mountainous districts. It rises to a height of 60 ft., with a trunk of a foot in diameter, and a magnificent spreading head of great double pinnate leaves, and triangular leaflets, the apex of the triangle being their point of attachment.

CARYSFORT REEF, off the s.e. coast of Florida, in 25° 13′ n., and 80° 13′ west. There is a light 106 ft. above tide. Navigation is dangerous on account of the proximity of the gulf stream.

CASA, the prefix to many names in Italian and Spanish, signifying "house" or "home."

CASABIAN'CA, LOUIS, 1755–98; b. at Bastia; an officer in the French navy, and at a later period a member of the national convention; later still one of the council of 500; and finally capt. of *L'Orient*, flag-ship of the fleet that transported Bonaparte and his army to Egypt. In the battle of Aboukir, when the fleet was attacked by the English, Casabianca fought to the last; and, with his son 10 years old, was killed in the blowing up of the vessel.

CASACALEN'DA, a t. of Italy, in the province of Campobasso, 17 m. n.e. of Campobasso, on the site of the ancient Calela. Fruits and wine of good quality are produced in the district, where silk-worms are also reared. Pop. 5,900.

CASA'LÉ, a city of n. Italy, province of Alessandria, situated on the right bank of the Po, which is here crossed by an iron bridge, 38 m. e.n.e. of Turin. It is a place of considerable antiquity, and occupies the site of a more ancient town. Many Roman remains are found, and coins of the early ages of the republic. It has a cathedral, dating from the 8th c., with valuable archives. The old citadel, founded in 1590, was one of the strongest in Italy, and within recent years the fortifications have been greatly strengthened and extended. During the Italian campaign of 1859, C. was occupied by divisions of the Sardinian army, and for a short time formed the head-quarters of the French emperor. It has manufactures of silk-twist, and a trade in the produce of the district, which is very fertile. Pop. '80, 17,096. C. formerly gave its name to a province which had an area of about 350 sq.m., and a pop. of about 143,000.

CASAL'-MAGGIO'RE, a t. of n. Italy, province of Cremona, on the left bank of the Po, 22 m. e.s.e. of Cremona. Being subject to frequent inundations from the river, strong embankments have been constructed for its protection. It has manufactures of earthenware, leather, glass, etc. Pop. 5,000.

CASAL'-PUSTERLEN'GO, a t. of n. Italy, province of Milan, 12 m. s.e. of Lodi, on the road to Cremona. It has manufactures of silk fabrics, linen, and earthenware, and an extensive trade in Parmesan cheese, which is here manufactured of the best quality. Pop. 5,600.

CASAMAS'SIMA, a t of Italy, in the province of Bari, 14 m. s.e. of the city of that name. It has a convent and two abbeys, and the vicinity produces wine and almonds. Pop. 6,600.

CASANO'VA, FRANCIS, a celebrated painter of battles and landscapes, was b. in London, of Venetian parents, 1732. Educated in Italy, he afterwards went to Paris, from which he was driven by the severe criticism of Diderot. C. then took up his abode in Dresden, where he painted chiefly battle-pieces, and by one of his greatest works gained a place in the academy. He afterwards went to Vienna, and painted for the empress

Catharine her victory over the Turks. He died at Briel, near Vienna, 1805. The execution, and especially the coloring of his works, are excellent.

CASANO'VA DE SEINGALT, Giovanni Jacopo, a notable adventurer of the Cagliostro species, was b., 1725, in Venice, and studied in Padua, afterwards in Venice, intending to enter the church. Having been expelled for sufficient reasons from a seminary of priests, he traveled to Naples, visited Rome, and after many adventures arrived in Constantinople. On his return to Venice in 1745, he supported himself for a time by his skill as a violinist, until he gained some celebrity by curing a senator who had been attacked by apoplexy. His irregularities again drove him from Venice. He now wandered about for some time among the chief cities in the n. of Italy, Milan, Mantua, Verona, Ferrara, Bologna, Parma, etc., but in 1750 he proceeded to Paris, where he was patronized by the nobility, and became acquainted with several eminent authors. It is needless to mention in detail his endless, inexplicable peregrinations. He visited almost every European capital, was somehow introduced to the best company, invariably excited the disgust or ill-will of those who knew him, and had always to "vanish" after a brief period of enjoyment. In 1761, we find him distinctly professing the miraculous after the Cagliostro fashion: he having undertaken to regenerate old Madame D'Urfé into a young man—for a consideration! He died in Bohemia in 1803. His celebrated memoirs, *Mémoires écrits par Lui-même* (12 vols., Leip. 1826–38), contain many interesting notices of the manners of his times, intermixed with details of his personal adventures.

CASAREEP, or Cassiripe, a sauce or condiment made from the juice of the bitter cassava or manioc root. It is in the highest esteem in Guiana, where it is employed to flavor almost every dish; and it is the basis of the favorite West Indian dish called *pepper-pot.* It is a powerful antiseptic, and meat can by means of it be kept for a long time quite fresh, even in a tropical climate. It is made by evaporating and concentrating the juice, which is also mixed with various aromatics. The poisonous principle of the juice is dissipated in the evaporation, so that although the juice in a fresh state is readily fatal to life, the C. is perfectly safe and wholesome. C. is imported into Holland and Britain, and remains unimpaired in quality for several years.

CA'SAS GRAN'DES (the "great houses"), a t. in Chihuahua, Mexico, 150 m. n.w. of the city of Chihuahua, celebrated for the ruins of early Mexican buildings still to be seen. These ruined houses are built of sun-dried bricks of mud and gravel, each brick about 22 in. thick and 3 ft. in length. The walls, which are in some places 5 ft. thick, seem to have been plastered both ou tside and inside. The main edifice, about 800 by 200 ft. in extent, is rectangular, and appears to have consisted of three separate piles united by galleries or lines of lower buildings, and the ruins indicate a height for the main staircase of six or seven stories. In the same vicinity are artificial mounds from which have been excavated stone axes, corn-grinders, and various other utensils. Similar ruins are found near the Gila, the Salimas, and the Colorado rivers.

CASAUBON, Isaac de, a great scholar and critic, was b. Feb. 8, 1559, at Geneva, where, in 1582, he was appointed professor of the Greek language. Subsequently he held professorships at Montpellier, 1596, and at Paris, 1598, but the death of Henry IV. rendered his position (C. being a Protestant) very insecure, and he therefore gladly accepted the offer of sir Henry Wotton to visit England. King James received him with distinction, and appointed him some time after prebendary of Canterbury and Westminster. He died in London, July 1, 1614. His acute investigation and criticism were applied to several branches of archæology and theology. Among his chief works may be mentioned the able dissertation, *De Satirica Græcorum Poësi et Romanorum Satira* (1605); the treatise *De Libertate Ecclesiastica* (1607); and the *Exercitationes contra Baronium* (1614), a confutation of cardinal Baronius. His critical and exegetical works include editions of Diogenes Laertius, Aristotle, Theophrastus, Suetonius, Persius, Polybius, Theocritus, Strabo, etc.—See *Isaac Casaubon,* by Mark Pattison (1875).

His son, Meric Casaubon, was b. at Geneva, 14th Aug., 1599; educated first at Sedan, he accompanied his father to England, and entered Christ Church college, Oxford, where he took his degree of M.A. in 1621. He was appointed rector of Ickham, near Canterbury, 1628, and afterwards professor of theology at Oxford. He died at Oxford, July 14, 1671. His attachment to Charles I. deprived him of all his preferments during the commonwealth, but at the restoration he received them again. Meric was, like his father, distinguished for his erudition; edited the works of Marcus Aurelius Antoninus, Terence, Epictetus, etc.; and wrote a treatise, *De Enthusiasmo* (Lond. 1655).

CAS'BIN, or Kazvin, a t. of Persia, in the province of Irak-Ajemi, 90 m. w.n.w. of Teheran. It is situated on an extensive plain of the same name, and is inclosed by walls. Before the time of Shah Abbas the great, C. was for a brief period the capital of Persia. The plain affords good pasturage, and in the vicinity of the town are extensive vineyards and orchards. The town is very extensive, but a great part of it is now in ruins, owing to its frequent subjection to earthquakes; and the population, which at one time was estimated at 200,000, in now probably not so much as a fifth of that number. Some velvets, brocades, and coarse cotton cloth are manufactured; and C. has also a considerable trade in raw silk, rice, etc.

CASCA, Publius Servilius, the one among the assassins of Julius Cæsar who, according to Plutarch, struck the first blow. This was done across the back of Cæsar's neck with a short sword, but the wound was not deadly, and the finishing of the work was left to Brutus and the others.

CASCADE RANGE, in Oregon and Washington territory; a mountain chain forming a continuation of the California coast range. The mountains are about 100 m. e. from the Pacific, and the more conspicuous peaks are Mts. Baker, Jefferson, Wood, Pitt, and Ranier, the latter the highest point—14,444 ft. above tide.

CASCARIL'LA (i.e., little bark, from Span. *cascara*, bark), the name given in South America to many different kinds of bitter medicinal barks which form articles of commerce. Peruvian bark itself bears no other name in the districts which produce it; and the name C. has recently been introduced in botany for a subdivision of the genus *cinchona* (q.v.). By European physicians and apothecaries, the name C. bark. (*cortex cascarillæ*) is given to the bark of the *croton eleutheria* (see Croton), a small tree, a native of the West Indies, where it is known as the *sweet-wood* and the *sea-side balsam*. It is imported in considerable quantities into Europe from the Bahama islands, and appears in commerce in small thin fragments and in quills. It is sometimes employed as a substitute for cinchona, although inferior in tonic and febrifuge qualities. It is a favorite medicine in Germany.—The barks of a number of other species of *croton* appear to possess properties similar to those of C. bark.

CASCO BAY, an indentation of the s.w. coast of Maine, about 20 m. wide n.e. of cape Elizabeth, near Portland. The bay contains hundreds of small islands which are much resorted to in the summer by pleasure-seekers.

CASE, in grammar. See Declension.

CASE, in legal phraseology, though often used as synonymous with cause, has, both in the law of England and Scotland, separate though not always very definite meanings. A formal written argument, prepared with a view to obtaining the opinion of a court of law, is called a case. By 15 and 16 Vict. c. 86, s. 61, the practice theretofore prevailing in the court of chancery of directing cases for a court of common law, is abolished. In Scotland, cases were formerly resorted to in almost every suit of intricacy and difficulty; but the abuse which arose from this practice has been remedied by 13 and 14 Vict. c. 36, s. 14. The statements which are laid before the house of lords in appeals from Scotland, are cases in the sense now indicated.—In Scotland and Ireland, as in England, questions in dispute can now be stated for the opinion of courts without the usual formality of pleadings, and decided more quickly.

CASE, in letter-press printing, a receptacle for types, generally made 34 in. long, 15 in. broad, and 1¼ in. deep, and divided into compartments or "boxes," each of which contains types of one class or letter. A pair of cases consists of an upper and a lower case: the upper one has 98 "boxes," and contains the capitals, small capitals, and some other letters that are only occasionally required in composition; the lower one has 53 "boxes," and holds the letters of the small character, figures, spaces, and most of the points. The places assigned to the several letters of the alphabet in the boxes of the case are not precisely the same in all printing-offices, but the differences are few. When in use, the cases lie on a frame 4 ft. high, and the compositor stands in front of them. The different sizes of the boxes in the lower case depend upon the comparative frequency in which the several letters occur in composition, and the position in the case allotted to each letter is such as to afford the greatest facility in composing. The letter *e*, which is most run upon in the English language, has a box much larger than any of the other compartments, and is placed directly in front of the compositor. In the upper case, the boxes are of uniform size, and the letters are placed in alphabetical order, the comparatively rare occurrence of capitals rendering it immaterial which letter is nearest the compositor's hand. A case will hold a quantity of "letter" sufficient to "set up" three pages of this work, which is equal to 18,000 types.

CASE, Augustus Ludlow, b. 1812; midshipman in the U.S. navy, in 1828, rising to be captain in 1863, and rear-admiral in 1872. He served in the Mexican war and in the war of the rebellion, in the latter participating in the capture of fort Hatteras and Clarke. In 1867, he was light-house inspector, and in 1869 chief of the bureau of ordnance. In 1875, he was retired.

CASE, William, 1784–1855; b. Mass.; a Methodist minister in the New York conference, and for 18 years presiding elder in the western and central part of the state of New York and in Canada. He was superintendent of Indian missions and schools in Canada until his death, and had also the chief direction of the Methodist ministry in that country.

CASEY, a co. in central Kentucky, on Green and Salt rivers; 350 sq.m.; pop. '80, 10,983—608 colored. It has a rough surface and produces grain, tobacco, butter, and wool. Co. seat, Liberty.

CASEY, Silas, b. R. I., 1807; a West Point graduate in 1826; in the Florida war in 1837–41, and made capt.; served in the Mexican war, and was wounded at Chapultepec;

served in the war of the rebellion at Fair Oaks and in other engagements, and was retired with the rank of brevet brig.gen. He is the author of a *System of Infantry Tactics*, and *Infantry Tactics for Colored Troops*. He d. 1882.

CASE-HARDENING is the process of converting the surface of certain kinds of malleable-iron goods into steel, thereby making them harder, less liable to rust, and capable of taking on a better polish. Fire-irons, portions of fine grate-fronts, gun-locks, and other articles of limited size, are very commonly so treated, but the process is sometimes applied to large objects, such as iron railway-bars. The articles are first formed of bar-iron, and being heated to redness, are sprinkled with a little powdered yellow prussiate of potash, and heated again. The result is, that the heat decomposes the prussiate of potash, and the liberated carbon combines with the iron, forming a coating of steel on the surface of the articles. Another mode of case-hardening is to heat the articles along with some animal matter, such as the parings of horns and a little common salt, from one half to several hours; the articles are then cooled in cold water, or in oil, when they are of a delicte nature. Charcoal alone is also employed. The coating of steel is very thin, seldom exceeding $\frac{1}{16}$th of an inch. Where it is wanted to be thicker, the articles are treated several times. A Swedish iron-master has found that a very excellent case-hardening is obtained by treating iron objects with a mixture of animal matter and arsenious acid dissolved in hydrochloric acid, and heating as usual.

CA'SËINE, or CASEUM, is an organic compound allied to albumen (q.v.), found in the milk of the mammalia, and in pease, beans, and other leguminous seeds, when it receives the name of LEGUMIN. The proportion of C. in milk (q.v.) varies, but averages about 3 per cent, and it may be coagulated and separated therefrom by the addition of a little rennet (q.v.), as in the manufacture of cheese (q.v.), or by the employment of a few drops of a mineral acid, such as dilute sulphuric acid. In either case, the C. separates as *curd*, which still retains attached to it some oil and earthy salts, though the greater portion of these substances, along with the sugar, remains in the watery liquid or *whey*. The elementary bodies which enter into the composition of C., and the proportion in which these are present in 100 parts, are—carbon, 53.83; hydrogen, 7.15; nitrogen, 15.65; oxygen, 22.52; and sulphur, 0.85. The properties of C. are, that it is not coagulated by heat, as is well evidenced in the heating of milk, but is coagulated on the addition of rennet; sulphuric, hydrochloric, or nitric acids; alcohol, creosote, or infusion of galls, but not by acetic acid. It also forms insoluble precipitates with solutions of the poisonous salts, acetate of lead, nitrate of silver, and bichloride of mercury (corrosive sublimate), and hence the efficacy of taking large doses of milk in cases of poisoning by those deadly salts, as the C. in the milk, forming an insoluble compound with the poison, keeps it from exerting its deadly powers.

The form of C. obtained from plants, and termed legumin, is generally procured from leguminous seeds, like pease or beans, though it can also be extracted from the majority of vegetable substances, especially from sweet and bitter almonds, and even from tea and coffee. Dried pease contain a fourth of their weight of legumin, and this can be extracted by bruising the pease to powder, and digesting in warm water for two or three hours. The liquid is then strained through cloth, which retains the insoluble matters, and allows the water with the legumin dissolved therein, and with starch mechanically suspended, to pass through. On settling, the starch falls to the bottom of the vessel, and the clear liquid holding the legumin in solution, on the addition of a small amount of acetic acid, yields a precipitate of legumin or vegetable Casëine. So perfectly does the vegetable C. resemble the C. from milk, that the one can hardly be distinguished from the other by chemical tests or by taste; and at the present time there is regularly prepared in various parts of China, especially near Canton, a form of cheese from pease, which is sold to the populace in the streets of Canton under the name of *taofoo*. C. is a most important article of food. See NUTRITION.

CASEMATE, originally a loopholed gallery excavated in a bastion, from which the garrison could do execution upon an enemy who had obtained possession of the ditch without risk of loss to themselves. Hence the designation, from Span. *casa*, house, and *matar*, to kill. As defense from shells became more important, the term was subsequently applied to a bomb-proof vault in a fortress, for the security of the defenders, without direct reference to the annoyance of the enemy. A *casemated* battery consists of such a vault or vaults, with openings for the guns. A C. may also serve for barracks, or for an hospital, or for a store-house. The great want of ventilation in casemates renders them bad places for barracks; and the artillerymen are nearly stifled with smoke when firing from such confined places.

CASEMENT (It. *casamento*, a large house), a frame with hinges to open and shut, closing part of the glazing of a window. Windows of this description are rare in this country, but are almost universal on the continent. Also a name for a deep, hollow, circular molding, similar to the *scotia* of classical and the *cavetto* of Italian architecture. The C. is very prevalent in the perpendicular style of Gothic architecture, and is sometimes enriched with running foliage.

CAS'ERNE is a barrack or building for the accommodation of the soldiers forming the garrison of a fortified town or post.

CASER'TA, a t. of Italy, in the province of the same name, is situated on a plain about 17 m. n.e. of Naples. It is chiefly remarkable on account of its magnificent palace, one of the finest in Europe, and formerly the frequent residence of the Neapolitan court. During 1860, C. acquired celebrity as the head-quarters of Garibaldi and his army. A royal silk manufactory has been established in the neighborhood. Pop., with adjoining hamlets (1881), 17,257.

CASE-SHOT, or CANISTER-SHOT, is an assemblage of bullets or small balls, inclosed in a cylindrical case or canister. The diameter of this canister is a little less than the bore of the gun from which it is to be discharged. According to the size of the canister, the balls vary from 1 lb. to ½ oz. each, from 30 to 280 in number, and from 3½ lbs. to 85 lbs. in total weight. The canister bursts immediately on leaving the gun, and the balls spread out into an irregular sort of cone. Within a range of 500 yards they work great execution among troops: they are generally used at 200 or 300 yards.

In a more modern and effective kind, called *spherical case*, the bullets are inclosed, along with a charge of powder, in an iron shell, instead of a tin canister. It is often called *shrapnel shell*, from the name of its inventor. A spherical case-shot for a 68-lb. carronade, or for an 8-inch howitzer, contains 337 balls; for a 24-pounder gun, 128; and for an 18-pounder, 90. It is exploded by a fuse, the length of which depends on the distance of the point where the destructive effect is to be wrought. Its effect is something like that of a prolonged musket-fire. The shrapnel shell is not of much use against the hull of a ship; but is very destructive against masses of men on shore, or on the decks of a ship, with a greater range than that of ordinary canister. Artillerymen prefer just such an amount of charge as will burst the sphere, without scattering the balls very widely.

CASH (Fr. *caisse*; a chest for containing money) is sometimes used as synonymous with money, as distinguished from produce, in which sense it includes all immediately negotiable paper—bills, drafts, and bonds, as well as coin and bank-notes. At other times, it is used, in a limited sense, to denote coin and bank-notes, as distinguished from negotiable instruments which pass by indorsation.

CASH ACCOUNT, or CASH CREDIT, a form of account with a bank, by which a person is entitled to draw out sums as required by way of loan to a stipulated amount. The practice began about 1729 in Scotland, with the banks of which country it is still peculiarly identified; but it is not unknown elsewhere, though on a somewhat different plan. In connection with the Scotch banks, the C. A. system is placed on a distinct and secure basis, which we shall briefly describe. The persons procuring a credit of this kind are for the most part retail-dealers, tradesmen, and farmers, who possess a limited capital, and need occasional loans. Instead of borrowing money by bills or mortgages, they apply to a bank for a C. A. to the extent, it may be, of £500. In the origin of the system, the bank may be said to have been influenced by three considerations—first, the necessity for making advantageous use of its capital; second, the desire to extend its issues of small notes; and third, the nature of the security offered. Since sir Robert Peel's act restricting circulation of notes, the second of these reasons no longer operates; for the banks are now much above their authorized issue, and must hold an equal amount of coin against the surplus. What the bank particularly wants, is a customer who will be constantly depositing sums in notes of other banks, and drawing out sums in its own notes. The C. A. system aids this process. It secures a customer who will be frequently operating on his account, according to the exigencies of his business, and whose overdrafts, as well as deposits, tend to benefit the concern. Obviously, for the debtor, the system works more advantageously than when a fixed sum is borrowed, for in that case interest would run on for the whole amount, whereas by a C. A. the trader merely draws what he requires; and by paying in his surplus money in small sums, he is charged with interest only on the sum actually at his debit from day to day. In negotiating a C. A., a bond is prepared by the bank stating the amount and the nature of the security, the cost of which is borne by the borrower. Banks often, in security, accept heritable property and policies of life insurance, but more commonly two persons in good credit become cautioners, or co-obligants along with the principal. Unless the liability of the cautioners respectively be expressly limited in the bond, each is liable for the whole amount. If the bank liberates one cautioner without the consent of the other, it loses its recourse. This recourse is not lost by accepting a dividend from the sequestrated (bankrupt) estate of a principal or cautioner; but it will be lost by accepting a composition from either of these persons without consent of the other. The bank can at any time stop the credit, and call for payment of the balance due. A cautioner can at any time withdraw his name from the credit, on paying up the balance, and the bank is bound to assign the debt to him. While cash accounts may be of great service to traders who act upon them discreetly, it is found that, in too many instances, these accounts are used as a dead-loan to the entire amount stipulated for; and for this, as well as a reason above assigned, banks care now very much less for this kind of business than formerly. Properly, traders are to look on the money procured on cash credits not as an addition to capital, but merely a temporary substitute for current business purposes while the capital is out with customers, and to be replaced accordingly until again required. It may be

added, that the progress of commercial wealth in Scotland, now greatly lessens the necessity for having recourse to the C. A. system. See MARGINAL CREDIT.

CASHEL, a t. of Ireland in Tipperary co., and 105 m. s.w. of Dublin by rail. It is irregularly built on the s. and e. slopes of an isolated height, rising abruptly from a rich and extensive plain. Pop. '81, 3,961. C. is a bishop's see, and returns one member to parliament. The ancient kings of Munster resided here. The top of the height, or "Rock of Cashel," is occupied by an assemblage of the most interesting ruins in Ireland, which have a grand effect from the country around. The ruins consist of a cathedral, the largest and most remarkable in the country, founded 1169, burned 1495, and afterwards repaired; a stone-roofed chapel, built 1127 by Cormac McCarthy, king of Munster, and the most perfect specimen of the kind in the country; Hore abbey, founded 1260; the palace of the Munster kings; and a round tower, 90 ft. high and 56 in circumference. The round tower is built of freestone, but the other ruins of limestone. At C., in 1172, the great synod was held in which the Irish prelates first acknowledged the authority of the English king and church.

CASHEW' NUT, *anacardium occidentale,* a tree of the natural order *anacardiaceæ,* a native probably of the tropical parts of both hemispheres, although it has been commonly regarded as of American origin. It is a spreading tree of no great height. It abounds in a clammy, milky juice, which turns black on exposure to the air, and is used in India for varnishing, but is so acrid as to produce painful inflammation when it comes in contact with the skin of some persons, or when they are exposed to its fumes. Others are apparently unsusceptible of its influence. The fruit of this tree is a kidney-shaped nut about an inch long, seated on the thicker end of a pear-shaped fleshy stalk, from which the botanical character of the genus is derived. The shell is double, the outer shell being ash-colored, and very smooth; and between it and the inner is a layer of very caustic black juice. The kernel is oily, and very pleasant and wholesome, and is in common use as an article of food in tropical countries, being made into puddings, roasted, and in various ways prepared for the table. In the West Indies, it is put into wine, particularly old Madeira wine, to which it is thought to communicate a peculiarly agreeable flavor, and for this use it is sometimes imported into Britain. It is also for the same reason sometimes an ingredient in chocolate. Yet the vapor which arises from it in roasting, but which is derived from the coating of the kernel, and not from the kernel itself, is so acrid as to cause erysipelas and other painful affections of the face in those who conduct the process, unless great caution is used.—The fleshy stalk, sometimes called the *cashew apple,* varies in size, being sometimes not much larger than a cherry, and sometimes as large as an orange, and is white, yellow, or red. It is perfectly free of the acridity characteristic of the natural order, is acid and eatable, very pleasant and refreshing, and much used by the inhabitants of the countries in which the tree grows. A very pleasant vinous liquor is obtained from it by fermentation; and this by distillation yields a spirituous liquor, highly esteemed for its flavor. A gum which exudes from the bark of the tree, quite distinct from the milky juice already mentioned, is bland, and very similar to gum-arabic.

CASHGAR, or KASHGAR, the political capital of eastern Turkestan, of which khanate —independent of China from 1865 till 1878—Yarkand is the commercial capital. C. stands 140 m. n.w. of Yarkand, in lat. 39° 25′ n., long. 73° 57′ e. It is surrounded by an earthen rampart, pierced with four gates, and is strongly garrisoned. It has manufactures of cotton, gold and silver cloths, carpets, etc.; and an extensive trade with Central Asia. Pop. estimated at 80,000. C. is said to have been an important commercial town before the Christian era, and was possessed for about a century by the Chinese. See YARKAND.—Eastern Turkestan is now frequently called after its capital. See TURKESTAN.

CASHIERING is a punishment for officers in the army and navy. It is a severe form of dismissal from the sovereign's service, and implies that the officer, by some disgraceful conduct, has deserved not only dismissal, but disqualification for ever again entering the service. Sometimes there are words added implying still deeper ignominy and degradation. On some rare occasions, when a court-martial has awarded C., the commander-in-chief has mitigated the punishment to simple dismissal. "Scandalous and infamous conduct," and "conduct unbecoming the character of an officer and a gentleman," mark two degrees of offense which may lead, the one to C., the other to dismissal.

CASHMERE′, a valley of the Himalaya, between India proper and middle Tibet, stretching between lat. 33° 15′ and 34° 35′ n., and long. 74° 10′ and 75″ 40′ e. Its bottom, a comparative level of about 2,000 sq. m., is 5,500 ft. above the sea; while the enclosure, as a whole, from ridge to ridge, besides fully doubling the area, attains, at some points, nearly thrice the altitude. The mountain-wall of this secluded region presents but few passes, and most of these too lofty to be practicable in winter. In fact, the Baramula itself does not admit a wheeled vehicle. Through this single opening, situated at the s.w., the Jhelum carries down towards the Punjab the gathered streams and lakes of the entire basin, and is navigable for the last 70 m. of its course. This net-work of waters, without swelling into inundations, affords everywhere a perennial supply for the purpose of irrigation. Besides the copious rains of spring, the snows of winter covering

even the plains to a depth of two feet for four months, accumulate, in every gorge and on every declivity, reservoir above reservoir, against the demands of summer. C. is traditionally believed to have been a vast upland lake, and alluvial deposits beyond the reach of existing influences would seem to confirm the idea.

In regard to climate, moderate but steady frost prevails from Nov. to Mar.; and again, the heat, ranging from 75° F. in June, to 85° in August, is often disproportionately oppressive, through the stagnation of the landlocked atmosphere. The staple production is rice, which, from the singular facilities of irrigation, is an all but sure crop, yielding, even in a tolerable season, 30 or 40 returns; and in the abundance and excellence of its fruits, C. is said to surpass all the rest of the world. The valley is, in general, considered to be remarkably healthy. The inhabitants, almost universally held to be models of strength and beauty, amounted, before 1828, to 800,000, or to 400 in a sq. mile. But by casual famine and pestilence they have since been reduced to 200,000. The people are mostly Mohammedans, divided between the Sunnite and Shite sects. The manufactures—all superior of their kind—are shawls, leather, fire-arms, and attar of roses. The principal towns are Serinagur, Islamabad, Shupayon, Pampur, and Baramula. The history goes back, through colossal monuments chiefly of marble, beyond the dawn of authentic annals. In 1315, C. first received Mohammedanism; in 1586, it was annexed to the Mogul empire; in 1752, it fell under the power of the Afghans; and in 1819, it was subjugated by the Sikhs. Lastly being ceded, at the close of the first war of the Punjab, to the British, it was by them transferred to Gholab Sing, as the nucleus of a state of its own name, which comprised also Jamu, Bulti, Ladakh, Chamba, etc. Area of principality, 68,944 sq.m.; pop. 1,500,000.—C. or Srinagar, the capital, lies on the Jhelum, about the center of the valley. Pop. 15,000. See Bellew's *Kasmir and Kashgar* (1875).

CASHMERE GOAT, a variety of the common goat, remarkable for its very long, fine, and silky hair, from which the highly valued Cashmere shawls are made. It is not so much in Cashmere that this variety of goat is to be found, as in Thibet, from which the finest goat-hair is imported into Cashmere, to be there manufactured into shawls. The hair is even longer than that of the Angora goat, and not, like it, curled into ringlets, but straight. It is about 18 in. long. A single goat does not yield more than three ounces, and the fleeces of ten goats are requisite for the manufacture of a shawl a yard and a half square. The hair is spun by women, and dyed after it is spun. It is said that 16,000 looms are kept in constant employment in Cashmere, producing annually about 30,000 shawls. The shawls are woven in rudely constructed looms, a pair of shawls sometimes occupying three or four men a whole year in weaving. C. shawls, of the finest quality, are sold in London at from £100 to £400 each. Plain shawls are simply woven in the loom, but those with variegated patterns are worked with wooden needles, a separate needle being used for each color. These shawls are in the highest request in India; but the hair of several other breeds of goat inferior to that of Thibet is employed for the manufacture of shawls called by the same name. Imitations of these are manufactured in France rather extensively, some from the Thibet wool entirely, and others of a mixture of this with silk and cotton. It is said that 24 lbs. of the best Thibetan goat-hair sell in Cashmere for 20 rupees, or £10 sterling.

Attempts have been made to introduce the C. G. into Europe. Baron Alstrœmer attempted, in the end of last century, to naturalize it in Sweden; and a very spirited attempt to introduce it into Britain has recently been made by Mr. Towers. A mixed race, produced by crossing the C. G. and the Angora goat, has been found to possess most valuable qualities, the hair being long, fine, and more abundant than in any of the parent breeds.—The male of the C. G. has very large, flattened, wavy horns.

CASIA, or Poet's Casia (*osyris alba*), a shrub of the natural order *santalaceæ*, a native of the s. of Europe, 3 to 4 ft. high, with linear-lanceolate deciduous leaves, long supple branches, numerous small white flowers, and red drupes (stone-fruit) of the size of a pea. The branches are used for making crates. The shrub has been much admired for its modest beauty. Keats speaks of

> "The drooping flowers
> Of whitest casia, fresh from summer showers."

CASIMIR, properly Kazimierz, was the name of many Polish princes and kings. With the establishment of the power of Casimir I. in 1040, the predominance of Christianity was decided in Poland. But the most distinguished of this name was Casimir III., called Casimir the great, who succeeded his father, Vladislaus Loketek, as king of Poland in 1333. He added little Russia and red Russia to his dominions; repelled the Tartars, who then threatened Poland; and waged successful war in Silesia, which he conquered but did not retain. He showed great anxiety for the advancement of the arts and of learning in his kingdom, and for the improvement of the condition of the most oppressed classes, which won him the title of king of the peasants. A Jewish mistress obtained from him liberties for the Jews, which they have since retained in Poland. He died in consequence of the falling of his horse in 1370.

CAS'IMIR I. (see Casimir), called "the peaceful," son of the Polish king, Miecislas II., and a German princess named Rixa. The mother endeavored to rule during

C.'s minority, but was compelled to fly to Germany, her son following her and leaving Poland in anarchy. In 1040, C. was called upon by his country, and, with the help of the German emperor, established his authority, drove out the plundering Bohemians, and earned the name of "the restorer." He left a moderately well organized government to his successor. He died 1058.

CAS'IMIR II., surnamed "the just," 1138–94; one of the four sons of Boleslas, king of Poland, and ruler over the reunited kingdom after the expulsion of Miecislas III. in 1177. Under C. II. the first Polish senate was organized, and laws were enacted defending the peasants against the oppression of the nobles.

CASIMIR IV., 1427–92; brother and successor, as king of Poland, of Ladislas III. He reigned 48 years; waged successful wars against the Teutonic knights; kept his country for most of the time in peace and prosperity; and introduced Latin into schools and official business. Of his six sons, three succeeded each other on the throne, one became king of Hungary and Bohemia, one was a cardinal, and one was canonized as a saint.

CASI'NO, an Italian diminutive of *casa*, a house, signifies a place for social reunions. The Italian nobles have long had casinos detached from the palaces in which they live, whither they can retreat and enjoy themselves, and it is probable that the *public* casinos were the result of an attempt made by the middle classes to imitate their superiors. In Italy, a C. is generally close by a theater, and is a place where musical or dancing soirées are held, containing a conversation-room, billiard-room, and rooms for other kinds of amusement, as well as small apartments where refreshments may be had. Casinos are numerous in Italy and Germany, and have been introduced into England. In general, they are not supposed to exert an edifying influence on the community.

CASINO, or MONTE-CASINO, a mountain overhanging the t. of San-Germano (the ancient Casinum), in the Italian province of Caserta, between 50 and 60 m. n.n.w. of Naples, is celebrated on account of the monastery founded here by St. Benedict (q.v.) in 529 A.D. This monastery is remarkable for its noble architecture, its ancient wealth, its library and archives, and in modern times for the learning of its monks, who have a printing-press, from which several important works have issued. The beautiful situation of the abbey, and the reputation of the monks as masters of the healing art, formerly made Monte-Casino a favorite resort of pilgrims. Luigi Tosti, the librarian of the abbey, has given an account of its literary treasures in his *Storia della Badia di Monte-Casino* (1841–43), and a most valuable catalogue (1st vol., 1874; 2d, 1876) is in preparation.

CA'SOLI, a t. of Italy, in the province of Chieti, situated on a hill 17 m. s. of the city of Chieti. Pop. between 5,000 and 6,000.

CASO'RIA, a t. of Italy, 5 m. n.n.e. from Naples. Silk is produced in the district. Pop. 8,000.

CASPÉ, a t. of Spain, in the province of Saragossa, 57 m. s.s.e. of the city of that name. It is situated near the Ebro, has manufactures of oil and soap, and a trade in the agricultural produce of the district. Pop. 7,500.

CASPIAN SEA, an inland sea or great salt lake, the largest in the world, on the boundary between Europe and Asia, extending from lat. 36° 40′ to 47° 20′ n., and long. 46° 50′ to 55° 10′ east. Its length from n. to s. is about 700 m., and its average breadth about 200 miles. Its total area is estimated at 180,000 sq. miles. The coast-line is irregular, and on the e. side especially there are several bays and indentations of coast, the principal being those of Mertvoi, Mangushlak, Kenderlinsk, Karabugos, and Balkan. From the w., the naphtha-impregnated peninsula of Apsheron stretches into the C. opposite the Balkan gulf; Mt. Caucasus also rises on its w. side. On the s. rises the lofty range of the Elburz mountains, between which, however, and the coast, on this side almost unbroken, extends a low flat plain of from 15 to 20 m., in breadth. On the n., it is bordered by great steppes, and the country eastward is a vast plain. It is probable that at one time its waters, which are said to be still diminishing, covered great part of the adjacent steppes. Some singular changes appear to take place in the level of the Caspian. Various measurements have made its depth and elevation different. One Russian measurement made it 348 ft. below the level of the Black sea, another only 84 feet. The latter is confirmed by maj. Wood (*The Shores of Lake Aral*, 1876). It has no tides, but its navigation is dangerous because of violent storms, especially from the s.e., by which its waters are sometimes driven for many miles over the adjacent plains. The depth near the southern end, is about 600 ft., and in some places near the center it attains a depth of nearly 3,000 ft.; but near the coast it is very shallow, seldom reaching a depth of more than 3 ft. at 100 yards from the shore, and in many places a depth of 12 ft. is not reached within several miles of the beach. On the n.e. and e. it is especially shallow. It receives the waters of a number of large rivers, of which the greatest is the Volga. The Ural, the Terek, the Kur, and the Atrek also fall into it. The water of the C. S. is salt, but much less so than that of the ocean. Its northern parts are covered with ice during winter. It abounds in fish, and very valuable fisheries are carried on, especially for sturgeon and salmon. By a canal uniting the head-waters of the Volga with the rivers Tvertza and Schlina, the

C. is united with the Baltic sea. The sea is now surrounded on three sides by Russian territory, the southern shore still remaining Persian. The Russians have a fleet stationed upon it, and the most of its commerce is in their hands. Steam packets have been established on it. The chief Russian town upon its shores is Astrakhan; less important are Derbend, Guriev, Baku, and Krosnoi-yar. Balfrush, Reshd, and Astrabad are Persian towns. The practicability of making the Amu-Daria (see OXUS), now running into the sea of Aral, again an affluent of the C. S., has recently been much debated.

The C. S. was known to the Greeks and Romans. According to Strabo, it derived its name from the Caspii, a tribe inhabiting its western shores. The name Caspian was afterwards limited to the western portion of the lake—the eastern being designated the Hyrcanian sea.

CASQUE'. See HELMET.

CASS, a co. in n.e. Dakota, organized since the census of 1870, on the Red river of the north. The surface is of river valleys and undulating prairie; and the soil is generally fertile. Co. seat, Fargo. Pop. '80, 8998—42.

CASS, a co. in w. Illinois, on the Illinois river, intersected by three railroads; 350 sq.m.; pop. '80, 14,494. The surface is level prairie and woodland; and the soil is very fertile, producing corn, wheat, oats, etc. There are also a number of manufactories of flour, lumber, paper, and carriages, Co. seat, Beardstown.

CASS, a co. in n.w. Indiana, on Wabash and Eel rivers, traversed by the Wabash and Erie canal and two or three railroads; 420 sq.m.; pop. '80, 27,610. With the exception of bluffs near the rivers, the surface is mostly level prairie and forest, producing cereals, butter, wool, etc. Co. seat, Logansport.

CASS, a co. in s.w. Iowa, on the tributaries of Nodaway river, and intersected by the Chicago, Rock Island and Pacific railroad; 576 sq.m.; pop. '80, 16,943. It is in an agricultural region. Co. seat, Lewis.

CASS, a co. in s.w. Michigan, on the Indiana border, traversed by the Lake Shore and Michigan Southern, the Peninsular, and the Michigan Central railroads; 528 sq.m.; pop. '80, 22,008. The surface is level prairie, with oak openings, and dense forests. Iron and limestone are found. Other productions are mainly agricultural, and there is considerable manufacturing business. Co. seat, Cassopolis.

CASS, a large co. in n. central Minnesota, nearly surrounded by the Mississippi river; 4,750 sq.m.; pop. '80, 486. There are numerous streams and a great number of large and small lakes, one of which (Itasca) is the source of the Mississippi. The Northern Pacific railroad will probably pass through the s. part of the county.

CASS, a co. in w. Missouri, on a branch of Osage river, and in part crossed by the Pacific railroad of Missouri; 1000 sq.m.; pop. '80, 22,431—750 colored. Surface mostly prairie; productions agricultural. Co. seat, Harrisonville.

CASS, a co. in s.e. Nebraska, on the Platte and Missouri rivers, intersected by the Burlington and Missouri River railroad; 570 sq.m.; pop. '80,16,684. The surface is chiefly prairie, well watered and fertile; productions agricultural. Co. seat, Plattsmouth.

CASS, a co. (formerly DAVIS) in n.e. Texas, on the Arkansas and Louisiana border, bounded n. by Sulphur fork, a tributary of Red river; 927 sq.m.; pop.'80, 16,723—6451 colored. It has a heavily wooded and fertile soil, producing cotton, rice, corn, etc. Co. seat, Linden.

CASS, LEWIS, an American statesman, b. at Exeter, N. H., in 1782. He was educated for the law, but quitting that profession, he entered the army in 1812, and rose rapidly to the rank of gen., though his merit was not very conspicuous. In 1813, he was elected governor of Michigan, in which state he settled. During his governorship, he kept himself apart from party politics, yet all his measures had a decidedly democratic tendency. In 1831, C. was made minister at war under gen. Jackson, and in 1836 he was sent as plenipotentiary to Paris. In this capacity he made himself popular by his replies, in *Galignani's Messenger*, to the attacks of the English press on the claims of the union with regard to its n.e. boundaries, and by his protest against the measures of Guizot; but the treaty concluded by Daniel Webster with lord Ashburton was so much opposed to the views maintained by C., that he resigned his post, and in 1843 returned to America, where he was received with marks of popular favor. He now aimed at the presidency, and in 1844 was put in nomination, but was defeated, as also in 1848, when he made another effort te obtain the supreme power. In 1857 he was appointed secretary of state, resigning office in 1860. Though active and energetic, he had no claim whatever to anything like comprehensive statesmanship. In regard to slavery, his ideas were ludicrously inconsistent, determined solely, as it would seem, by a view to what would be popular with those whose favor he was seeking to secure at the moment. Latterly, he went wholly along with the slave-holding party, advocating an extension of territory with a view to extend the ramifications of slavery. But he was chiefly remarkable on account of his bitter hostility to Britain, against which he was ever ready to inflame the minds of his countrymen on the slightest and silliest pretext. He is author of the *History, Tradition, Languages, etc., of Indians in the United*

States; of *France—its King, Court, and Government;* and other works. He died in June, 1866.

CASSA'BA, or CASABA, a t. in Asia Minor, 63 m. e. of Smyrna, with which it is connected by a railroad. C. has a flourishing trade with the surrounding district. Cotton is one of the chief articles of trade, and silk-worms are raised for export. Another valuable industry is the raising of melons for the Constantinople market. In 1865, a large portion of the town was destroyed by fire, and in the same year there were many deaths from cholera. Pop. about 15,000, two thirds of whom are Turks.

CASSAGNAC. See GRANIER DE CASSAGNAC, *ante.*

CASSAN'DER, king of Macedonia, and son of Antipater, was b. about 354 B.C. When young, he is said to have been ill used by Alexander the great, and to have consequently conceived a mortal hatred to that monarch's family, On the death of his father, he expected to succeed to the regency; but Polysperchon received the honor instead. which so dissatisfied him, that he resolved to contest the sovereignty with his opponent. He was completely successful; but while pursuing his career of conquest in the s. of Greece, he learned that Olympias, mother of Alexander, was committing havoc in the north, and consequently hurried back to Macedonia. In less than a year Olympias was taken prisoner, and put to death. Only Roxana, wife of Alexander, and her son Ægus, now stood between him and the throne of Macedon; but he did not find it convenient to "make away" with these two until several years had passed. Meanwhile, he married Thessalonica, half-sister to Alexander, in whose honor he founded, about 316 B.C., the town which bears her name. In the following year he caused Thebes, which Alexander had destroyed, to be rebuilt. He next became involved in a war with Antigonus, king of Asia, which, with an intervening peace of one year, lasted from 315 to 301 B.C., in the last of which years Antigonus was defeated and slain at the battle of Ipsus. Along with his auxiliaries, Seleucus, Ptolemy, and Lysimachus, he seized and shared the dominions of the vanquished. The rest of his life was spent in intrigue and military enterprise. He died 297 or 296 B.C.

CASSAN'DER, GEORGE, 1515–66; a native of Zeeland; professor of classics at Bruges and Ghent; spent most of his life in trying to effect a union between the Roman Catholic and Protestant churches; to which end he published several works, which had the distinction of being both fiercely attacked by Calvin and pointedly denounced by the council of Trent.

CASSANDRA, according to Homeric legend, was the fairest daughter of Priam and Hecuba, and the twin-sister of Helenus. The children playing in the court of the temple of the Thymbræan Apollo, not far from Ilium, till it was too late for them to return home, a bed of laurel twigs was made for them in the temple; and there, in the morning, two snakes were found licking their ears, from which resulted such an acuteness of hearing, that they could hear the voice of the gods. C. afterwards attracted the love of Apollo by her beauty, and he taught her the secrets of prophecy; but displeased by her rejection of his suit, laid upon her the curse that her vaticinations should never be believed. Accordingly, she prophesied in vain of the treachery of the Grecian horse and the destruction of Troy. On the capture of the city, she fled to the temple of Minerva, but was torn from the altar by the Locrian Ajax, and ravished in the temple. She afterwards, in the distribution of the prey, fell to the share of Agamennon, to whom she bore twin sons, but was murdered by Clytemnestra.

CASSANDRA, a peninsula in the province of Roumelia, European Turkey, situated between the gulfs of Salonica and Cassandra, in lat. 40° n., long 23° 30′ e. The ancient name of this headland was *Pallene.* Grain of superior quality is raised here; wool, honey, and wax are produced; and silk-worms are extensively reared. The gulf of Cassandra (ancient *Toronaicus Sinus*) has a length of 33 m. from s.e. to n.w., and a breadth of 10 miles.

CASSA'NO, a t. of Italy, in the province of Cosenza, 34 m. n. of the town of that name. It is situated in a valley in the midst of the most beautiful scenery, has a cathedral, an old castle built on an imposing mass of rock in the midst of the city, and manufactures of linen, leather, silk, cotton, and macaroni. Pop. 8,000.

CASSA'NO, a t. of northern Italy, 17 m. e.n.e. of Milan. It is situated on the right bank of the Adda, here crossed by a bridge on the railway to Brescia, and has extensive silk-mills. C. was the scene of two sanguinary battles—one in 1705, between the French under the duke de Vendôme, and the imperialists under prince Eugene, in which the latter were defeated; the other in 1799, when the Russians and Austrians under Suwarow defeated the French under Moreau. Pop. 4,500.

CASSATION, COURT OF. In the law of France, the act of annulling the decision of a court or judicial tribunal is called *cassation,* from the verb *casser,* to break or annul (Lat. *quatere;* Eng. *quash*); and the function of cassation, as regards the judgments of all the other courts, is assigned to a special tribunal called the court of C., which may thus be regarded, in a certain sense, as the last and highest court of appeal for the whole country. But as everything is excluded beyond the question whether or not the view taken of the law, and of the proper method of administering it by the inferior tribunal, has

been the right one, the idea attached to this institution is less that of a court in the ordinary sense, than of a department of government to which the duty of inspecting the administration of justice is assigned. By the 65th article of the constitution of the year VIII., it was enacted that there shall be "for the whole of France a tribunal of cassation, which shall pronounce on demands for cassation against judgments in the last resort pronounced by the tribunals;" and the following article of the same constitution bears that this supreme tribunal shall pronounce no judgment on the foundation or merits of the cause, but that, in case of its breaking the judgment pronounced, it shall remit to the tribunal appealed from to pronounce another. The title of tribunal was afterwards changed for that of court, by a *senatus consultum* of the year XII.; but substantially the institution has retained its original character, notwithstanding all the changes of government which have occurred in France. The demand for cassation can be made only by the parties to the suit, or by the *procureur-général* of the court of C. for the public interest. Criminal as well as civil judgment may be reviewed by the court of C., the only exceptions being the judgments of justices of the peace and of courts-martial, military and naval. The delay allowed for bringing a civil case before the court of C. is three months for persons domiciled in France, six months for those in Corsica, a year for American colonists, and two for all persons resident beyond the cape of Good Hope. In criminal matters, the procedure is greatly more prompt, three full days only being allowed to the person condemned to bring his action of C., and the same space being given to the procureur-général. In all criminal and police cases, the court of C. may pronounce judgment immediately after the expiry of these days, and must do so within a month. The court of C. is divided into three sections, one of which is devoted to criminal matters. Its staff consists of a president, who has the title of *first* president, and three vice-presidents, who are called presidents; 45 counselors or ordinary judges; a procureur-général, or public prosecutor; 6 substitutes, who have the title of advocates-general; and several inferior officers. The presidents and counselors are named by the sovereign for life, the other officers being removable at pleasure. No judgment can be pronounced unless 11 judges are present, the decision being determined by the majority. Where the numbers are equally divided, 5 judges are called in; and cases of peculiar difficulty may be judged of by the three sections united. The whole court, when presided over by the minister of justice, possesses also the right of discipline and censure over all judges for grave offenses, not specially provided for by the law. When thus constituted, the court of C. may suspend the judges of the imperial courts from the exercise of their functions, and call them to its bar. The procureur-général of the court of C. likewise possesses a surveillance over the procureurs-généraux of the imperial courts.

The members of this august tribunal wear a red gown with a violet *toque*, or cap of velvet; the robes of the presidents and of the procureur-général being doubled with white fur.

CASS'AVA, a West Indian name of the plant also called Manioc (q.v.), and of the starch produced from it, which is otherwise called Brazilian arrow-root, and is popularly known in Britain as Tapioca (q.v.).

CASSAY', or MANIPUR', a mountainous country in farther India, to the s.e. of Upper Assam, stretching from 23° 49′ to 25° 41′ n. lat., and from 93° 5′ to 94° 32′ e. long., and having an area of 7,584 sq. miles. It contains a pop. estimated at 126,000. It is important to England merely from its being on the Burmese frontier. Accordingly, before the war of 1825 began, it was occupied by the British; and, being permanently ceded at the close of the contest, it was handed over, free from tribute, to the native rajah. The inhabitants are more generally Brahmanists than Buddhists. The productions are tea, rice, tobacco, indigo, cotton, sugar, opium, and mustard; and the manufactures are muslins, silks, and a few iron wares. The chief town is Manipur, which sometimes gives name to the principality.

CASSEL, the capital of the former electorate of Hesse-Cassel, now a portion of Prussia, pleasantly situated on both sides of the Fulda. here a navigable river, 120 m. by rail, n.n.e. of Frankfort-on-the-Main. It contains (1880) 58,290 inhabitants, including military and servants and laborers connected with them. The oldest part of the town consists of a few very narrow, crooked streets, close on the banks of the Fulda; the more modern parts are on hills, which rise gently from the river. C. is partially walled. In Friedrichs-Platz, the largest square in any German town, stands the elector's palace, a comparatively mean structure: a little below is the first story of a magnificent palace commenced in 1820, and stopped in the following year by the death of the elector who projected it. Amongst the other public buildings and institutions, one of the most important is the *Museum Fredericianum*, which has a library of 90,000 volumes and some valuable MSS. The picture-gallery contains about 1400 paintings, including some excellent specimens of the best masters. In the cabinet of curiosities, there are examples showing the gradual development and improvement of watch-making from the earliest invention at Nuremberg to the present time. C. contains an observatory, and is the seat of a number of learned and scientific associations. From 1807 to 1813 it was the capital of the kingdom of Westphalia. The gardens of Wilhelmshöhe—which was assigned by the present emperor of Germany to the late emperor Napoleon as a resi-

dence after his fall at Sedan, in Sept., 1870—with their splendid fountains and cascades, and the colossal statue of Hercules, within the hollow of whose club eight persons can stand at one time, are only 3 m. from Cassel. There are manufactures of cotton, woolen, and silk fabrics, lace, and carpets. Under the name of *Chassala*, the town appear to have existed as early as the 10th century.

CASSEL, a t. of France, in the department of the Nord, 27 m. n.w. of Lille. It is pleasantly situated on a hill, overlooking a country on all sides so flat, that the view, although the elevation is only 800 ft., is said to be one of the widest in Europe, extending over the broad fertile plains of Flanders, and to the chalk cliffs of England, and taking in 32 towns and 100 villages. During the great trigonometrical survey undertaken in the reign of the first Napoleon, Mont Cassel was one of the chief signal-stations. C. has manufactures of lace, linen, thread, hosiery, etc. Pop. '76, 3,224. It was known to the Romans, who had a station here, as *Castellum*.

CAS'SEL, Paulus Stephanus Selig, b. 1821; a German author of Jewish descent; educated both in Roman Catholic and Protestant schools; finished his studies under Ranke in Berlin, and became a journalist. He was in the Prussian chamber of deputies, 1866-67, and declined re-election, preferring to become minister of Christ church, Berlin. He has published articles and books on the Jews, and on religion and politics; and is well known as a lecturer on papal history, the German war, etc.

CASSERLY, Eugene. See page 890.

CASSIA: co. Idaho. See page 890.

CASSIA, a name given by the ancients to a kind of medicinal bark, but their descriptions are so imperfect that it is impossible to determine what bark it is. The name is employed in the English translation of the Old Testament in Exodus xxx. 24, and in Psa. xlv. 8, its use in these places being derived from the Septuagint; and it is not improbably supposed that the substance intended is the same now known in our shops as *C. bark*, or *C. lignea*.—2. *C.* is now the botanical name of a genus of plants of the natural order *leguminosæ*, sub-order *cæsalpineæ*, containing many species—more than 200 having been described—trees, shrubs, and herbaceous plants, natives of Africa and of the warm parts of Asia and America. They have abruptly pinnate leaves, and flowers with deciduous calyx of five somewhat unequal sepals, corolla of five petals, of which the lower ones are the larger, ten free stamens, of which three are long, four short, and three abortive, and anthers opening by two holes at the top. The leaves and pods of many species have a peculiar sweetish but nauseous smell, and a nauseous bitter taste accompanied with a loathsome sliminess. They seem all to contain the purgative principle called cathartine (q.v.), and the leaves of some of the Asiatic and African species are highly valued, and much used as a medicine, under the name of Senna (q.v.). The leaves of *C. Marylandica* possess similar properties, and are now used to some extent in the United States of America.—*C. fistula* (*cathartocarpus*) yields the C. of the pharmacopœias, the *C. poàs*, *pipe C.*, or *purging C.* of the shops. It is a large tree, a native of Egypt and other parts of Africa, perhaps also of the East Indies, in which, at all events, it is now widely diffused and cultivated, as well as in the West Indies and warm parts of America. Its leaves have 4 to 6 pair of ovate smooth leaflets, its flowers are yellow and in loose racemes; its pods, which have obtained for it the name of *pudding-pipe tree*, are sometimes 2 ft. in length, cylindrical, black, consisting of thin brittle woody valves, within which is a cavity divided by numerous thin transverse partitions, each cell containing a single seed imbedded in a soft black pulp. It is this pulp that is the part used in medicine; it has a sweetish mucilaginous taste, and in small doses is a mild laxative. It is sometimes removed from the pods when fresh; or an extract is obtained, after they are dried, by boiling and evaporating. It is said to contain 61 to 69 per cent of sugar. The C. pods of the West Indies contain much more pulp, and are therefore more valuable than those imported from the East.—3. *C. bark*, or *C. lignea*, sometimes called *China cinnamon*, is a bark very similar to cinnamon both in appearance and properties; but in thicker pieces, and less closely quilled, of a less sweet and delicate flavor, but more pungent. It is the produce of the *cinnamomum C.*, or *aromaticum*, a tree of the same genus with the cinnamon-tree, a native of China, and extensively cultivated there. It is highly esteemed by the Chinese, and is now largely imported into Europe. As it contains a greater proportion of essential oil, and is also much cheaper than true cinnamon, it is much more generally used. The oil which it contains is called *oil of C.*, and is very similar to oil of cinnamon. Coarse cinnamon is sometimes sold as cassia. *C. buds* are believed to be the dried flower-buds of the same tree which yields C. bark. They are now imported into Britain in large quantities, and are much used in confectionery. In flavor and other qualities they resemble C. bark; in appearance they are very similar to cloves.

CASSIA'NUS, Joannes, or Joannes Massiliensis, or Joannes Eremita, a Christian teacher of the ancient church, who flourished in the early part of the 5th c., and distinguished himself as the promoter of monachism in Southern Gaul, and as the opponent of the extreme dogmas of St. Augustine respecting grace and free-will. Shortly before 415 A.D., he went to Massilia (Marseille), where he founded two monasteries according to the rules laid down in his *De Institutis Cœnobiorum*. One of these monasteries was for nuns, the other was the famous abbey of St. Victor, which under C. is said to have possessed not less than 5,000 inmates, and which served as a model to a multitude of monastic institutions in Gaul and Spain. His *Collationes Patrum Sceti-*

corum, is a work in 24 chapters, each of which gives a "spiritual colloquy between monks in the desert of Sketis," regarding the monastic life, and the vexed questions of theology. C.'s Grecian erudition, his dislike of dogmatic subtleties, and his zeal for monastic habits, led him to oppose the doctrine of St. Augustine on works and grace, and to set up a doctrine which was known by the schoolmen as "semi-pelagianism." See PELAGIANISM. As C.'s doctrine gained support from the Massilian monks, St. Augustine, having been informed of it by his friend Prosper of Aquitaine, wrote strongly against it, especially in his treatise *De Gratia et Libero Arbitrio, contra Collatorem.* It is not known when C. died; but it must have been subsequent to 433 A.D. The first collected edition of the various works attributed to him was published at Basel in 1559; the best at Frankfurt, in 1722. The best account of his life and writings is by Wiggers, *De Johanni C.* (Rostock, 1824–25).

CASSICAN, *Cassicus*, a genus of birds allied to starlings, having an exactly conical bill, thick at the base, and extremely sharp pointed, the commissure forming an angulated line, the bill ascending on the forehead, and encroaching circularly on the plumage. They are all American birds of gregarious habits, feeding both on fruits and insects, and "exhibiting such surprising skill and ingenuity in the structure of their nests, that an old lady once gravely asked an American ornithologist whether he did not think they might be taught to darn stockings!" The crested C., or crested oriole (*C. cristatus*), is a native of Brazil, Guiana, and Paraguay. It is about 20 in. long, is sometimes seen in flocks of 50 or 100, and constructs its nest by knitting together shreds of a thin bark, *tillandsias*, etc. The nest is about 36 in. long, and resembles a purse or pouch, the lower end hemispherical, and 10 in. wide, and is suspended from the extremity of a branch of a tall smooth-stemmed tree on the outskirt of a forest, apparently to insure safety from monkeys and serpents. Several of these nests are often to be seen hanging from the branches of the same tree.

CASSIDA'RIA, a genus of mollusks—class *gasteropoda* (q.v.), order *pectinibranchiata*—with univalve shells, generally regarded as belonging to the family *buccinidæ* or whelks (q.v.), but is forming a connecting link with the family *muricidæ* (see MUREX). The shell is ventricose, with a moderately elevated spire, the aperture elongated, and the canal recurved, but not very abruptly—much less so than in the nearly allied genus *cassis* (see HELMET SHELL).—the columellar lip covered with a plate, and the outer lip similarly margined within. The recent species, which are not numerous, belong to tropical and subtropical seas. Fifty fossil species have been described. The genus first appears in the upper cretaceous measures, where a single species occurs. In the eocene 11 have been found, and about 40 in the pliocene. It has its fullest development as a recent shell, no less than 70 species being known.

The name *cassidariæ* is sometimes given to a family of coleopterous insects, of which the type is the genus *cassida*. See TORTOISE BEETLE.

CASSIDY, GEORGE W. See page 890.

CASSIN, JOHN, 1813–69; b. Penn.; except a few years in business, he devoted most of his life to ornithology, and published many works thereon, among which are *Birds of California; American Ornithology; Mammalogy and Ornithology of the U. S. Exploring Expedition; Ornithology of the Japan Exploring Expedition; Ornithology of Gilliss's Astronomical Expedition to Chili;* a portion of the *Ornithology of the Pacific Railroad Explorations and Surveys;* and the ornithology of the *Iconographic Encyclopædia.* He was grand-nephew of commodore John Cassin, and nephew of commodore Stephen Cassin, both of the U. S. navy.

CASSI'NI, the name of a family distinguished by their services in astronomy and geography.

CASSINI, GIOVANNI DOMENICO, was b. at Perinaldo, near Nice, on the 8th of June, 1625, and studied at the college of Jesuits, Genoa. In 1650 he was appointed to the astronomical chair in the university of Bologna. His first work related to the comet of 1652. He subsequently devoted himself to the determination of astronomical refraction, and of the sun's parallax, etc. In 1664–65 he determined the period of Jupiter's rotation. Subsequently, he determined the periods of the planets Mars and Venus, as also of the *apparent* rotation of the sun. He it was who discovered the third and fifth satellites of Saturn, and afterwards the first and second, as well as the dual character of that planet's ring. He was also the first who carefully observed the zodiacal light; he demonstrated that the axis of the moon was not (as had been believed) at a right angle to the ecliptic, and explained the cause of the phenomenon known under the name of lunar libration. One of his finest observations was the coincidence of the nodes of the moon's equator and orbit. C. died Sept. 14, 1712, at Paris, whither he had gone in 1669, at the invitation of Colbert, to take charge of the observatory erected by that minister.

CASSINI, JACQUES, son of the preceding was b. at Paris, Feb. 18, 1677. In 1694 he was elected a member of the academy of sciences. He traveled in Italy, Holland, and England, where he formed the acquaintance of Newton, Halley, Flamsteed, etc., and was elected a member of the royal society of London. On the death of his father, he succeeded to the charge of the observatory at Paris, and died April 16, 1756. C. wrote several treatises on electricity, the barometer, etc. In his treatise, *De la Grandeur et de la Figure de la Terre* (Par. 1720), he attempted to show that the earth must be a spheroid

elongated at the poles. The Newtonians denied this, inasmuch as it was opposed to the ascertained facts of gravitation and rotation, which necessitated the earth's being a spheroid flattened at the poles. As an observer, C. was eminently successful. He determined the periods of rotation of all the satellites of Saturn then known, the inclination of the planetary orbits, the obliquity of the ecliptic very nearly, and the length of the year, etc.—His son, CÆSAR CASSINI, was also engaged in scientific pursuits.

CASSINI, JEAN DOMINIQUE, Comte de, the son of Cæsar Cassini, was b. at Paris, June 30, 1748. He succeeded to the charge of the observatory, and completed in 1789 the great topographical map of France, begun by his father. But it having been decreed in 1793 that the observatory should no longer be in the hands of one person, three others were in consequence elected to the superintendence of it along with C., whose conduct on learning this fact showed that he had a greater regard for his own dignity than for the whole stellar universe. He refused to have anything more to do with astronomical science, and obstinately kept his purpose through a life that lasted nearly a century, and which was apparently so prolonged to test the durability of a Frenchman's disdain. In his 95th year he published a small volume of poems! He died Oct. 18, 1845.

CASSI'NO, a game at cards played by two or more persons. Four cards are dealt, one at a time, to each player, and four are turned face up on the table. After the hands are played the greatest number of cards counts the holder three, the greatest number of spades one, big C. (the ten of diamonds) two, little C. (the deuce of spades) one, and each ace one, so that nine can be possibly counted by one person; the whole game is 21. The play is to take from the table as many cards as possible, preferring spades, or aces, or big or little Cassino. The cards are taken by the number of their spots; thus a ten will take a ten, or a nine and an ace, or four aces and a six, or any combination of spots that make just ten. Another part of the game is "building;" for example, a player puts a four on a six to make up ten, meaning to take both when it again comes his turn; but any one having a ten may take them before him; or if he builds a six, the next player may make it a nine, and the next still may put on an ace and call it ten; but in building, the one who makes any particular number must hold the card that will take it. Some persons make a progressive build; that is, if one has a nine and cannot at the time make a nine, he puts a four on a two and calls it six, having of course a three to make nine when it is next his turn to play. But this kind of building is generally ruled out as irregular. A modern variation of the game is now common, in which the knave counts eleven, the queen twelve, the king thirteen, the ace one or fourteen as the players may choose, and the "joker" fifteen. This plan greatly enlarges the number of combinations, and makes the game more intricate; as, for instance, an ace may possibly take three other aces, four deuces, and a tray, making fourteen spots; or the ace may take the big and little C. and two aces, which would make six points in the game.

CASSIODORUS, or (according to several MSS.) CASSIODO'RUS, MAGNUS AURELIUS, a Latin writer, who distinguished himself by his erudition in an age of barbarism, was b. at Scylaceum (now Squillace), in Calabria, about 468 A.D. He was a member of a noble Roman family, and soon attracted the attention of Odoacer by his superior abilities and accomplishments. Under this monarch he held various offices, but after the defeat and murder of Odoacer by Thedoric the Ostrogoth, he passed into the service of the latter. The highest honors now fell upon him; and for years he administered the Ostrogothic power with remarkable prudence and success. In his 70th year, however, he withdrew to Calabria, where he founded the monastery of Viviers, and employed himself and the other monks in the invaluable work of copying classical MSS.; his great desire being to improve the education of the clergy. C. was about 100 years old when he died. Besides his grammatical and rhetorical manuals, which were used as text-books during the middle ages, he wrote a very important work, entiled *Variarum Epistolarum Libri XII.* This is a collection of state-papers, and is, in fact the most extensive as well as the most reliable source of information which we possess in regard to everything connected with the Ostrogothic rule in Italy. The style, however, is very peculiar, and shows the influence which the political career of C. had exercised on his language and modes of thought. The editio princeps of the *Variarum* was printed at Augsburg in 1533.

CASSIOPE'IA, the *lady in her chair,* a constellation in the northern hemisphere, near Cepheus, and not far from the n. pole. It is marked by five stars of the third magnitude, forming a figure like an M. A line from Capella to the bright star in Cygnus passes nearly through the middle of this M. C., according to Flamsteed, contains 55 stars, all of small magnitude. The figure is that of a woman siting in a chair with a branch in her hand. In the year 1572, there all at once appeared in C. a new star. It was first noticed by Tycho Brahé on the 11th Nov., when its luster exceeded that of all the fixed stars, and nearly equaled that of Venus. The star gradually diminished in luster, from the time of its being observed until, in Mar., 1574, it disappeared. It is said to have alarmed all the astronomers of the age. Tycho Brahé wrote a treatise on it, and supposed—without good reasons—that it had previously appeared in 945 and

1264. Sir John Herschel suggested the possibility of its reappearance in 1872, but his suggestion was not verified.

CASSIQUIA'RÉ, or CASSIQUIARI, a river of Venezuela, South America, forming the s. bifurcation of the Orinoco, which it leaves in lat. 3° 10′ n., long. 66° 20′ w., and after a rapid s.w. course of about 130 m., joins the Rio Negro in lat. 2° 5′ n., long. 67° 40′ west. About 100 yards in breadth when it issues from the Orinoco, it gradually increases until at its union with the Rio Negro it attains a width of 600 yards. By means of this singular river, water-communication is established, through the Amazon, Orinoco, and their affluents, between the interior of Brazil and the Caraccas in Venezuela.

CAS'SIS (Fr., the black currant-tree), a French liqueur prepared from black currants; the manufacture has recently become of great importance. See CURRANT.

CASSIS. See HELMET SHELL, *ante*.

CASSITE'RIDES. See SCILLY ISLES.

CAS'SITERITE, the common ore of tin, the only source of the metal; found in Banca (an island in the Malay archipelago), in Cornwall (England), Spain, Sweden, France, California, and Chili. It consists of 78.38 tin, and 21.62 oxygen; it is found in mass, in fibres, in rolled flakes, and in grains.

CAS'SIUS, LONGI'NUS CAIUS, one of Cæsar's assassins. At the breaking out of the civil war, though a tribune of the plebs, he sided with Pompey and the aristocratic faction against Cæsar. He was taken prisoner by the latter, who pardoned him, and even made him one of his legates. In 44 B.C., through the influence of Cæsar, he was made *prætor peregrinus*, and was promised the governorship of Syria in the following year. But his mean and jealous spirit could not endure the burden of gratitude imposed upon him by the generosity of the dictator, and he resolved to be released by the murder of his benefactor. Having attached to himself the mutinous spirits among the subjugated aristocracy, and also won over M. Brutus, the pseudo-patriotic conspiracy was soon matured, and on the 15th of Mar., 44 B.C., Cæsar fell by the daggers of assassins. The result of this bloody deed was not what C. had expected. The popular feeling—as witnessed by the riots that broke out at Cæsar's funeral—was strongly against the murderers; and the military power fell into the hands of Mark Antony. C. therefore fled to the east, and made himself master of Syria. Afterwards he united his forces with those of Brutus, and having greedily plundered Asia Minor, they crossed the Hellespont in the beginning of 42 B.C., marched through Thrace, and took up a superior position near Philippi, in Macedonia. Here they were attacked by Antony and Octavian. The division commanded by C. was totally routed, although, on the other hand, Brutus succeeded in repulsing the troops of Octavian. C., supposing that all was lost, compelled his freedman, Pindarus, to put him to death. C.'s wife, a half-sister of Brutus, survived him upwards of 60 years. She died in the reign of Tiberius, 22 A.D.

CASSIUS, PURPLE OF, is a coloring substance of very ancient use, which is prepared by adding a mixed solution of protochloride and bichloride of tin gradually to a solution of chloride of gold, when a more or less abundant precipitate of the double stannate of gold and tin (AuO,SnO_2+SnO,SnO_2) is thrown down. The purple of C. is soluble in ammonia, yielding a very pretty purple solution, from which it can again be obtained, with solid form unchanged, by evaporating the ammonia. Mixed with borax, or some fusible glass, purple of C. is employed by the potter to communicate a rich purple or rose tint to the better kinds of china, and it also imparts the red color to the kind of glass known as *Bohemian glass*.

CASSIUS PARMENSIS, or CAIUS CASSIUS SEVERUS, one of the conspirators against the life of Julius Cæsar. He was an adherent of his namesake Cassius, and fought on his side until their defeat at Philippi. Afterwards he adhered to Pompey, and finally supported Anthony until the defeat at Actium. He went to Athens, but was arrested and executed by order of Augustus. He made some pretensions to poetry, but he was not the Cassius alluded to by Horace as noted for the abundance and the poverty of his compositions.

CASSIVELAU'NUS, a British chief, who fought against Cæsar during his second invasion of the island, 54 B.C. He ruled the country n. of the Thames, and had a great reputation as a warrior, but his capital was taken by the Romans, and he himself compelled to flee. He afterwards sued for peace, which he obtained, on condition of paying tribute and giving hostages.

CASSOCK, a long loose coat, formerly in common wear, but now usually worn only by the clergy. As worn by the clergy of the church of England it is a long coat with a single upright collar. Black is the common color for all orders of the clergy, but on state occasions bishops frequently wear purple cassocks. In the Roman Catholic church cassocks vary in color according to the dignity of the wearer—priests wearing black, bishops purple, cardinals scarlet, and the pope white.

CAS'SOWARY, *Casuarius*, a genus of birds nearly allied to the ostrich (see BREVIPENNES and OSTRICH), but distinctively characterized by still greater shortness of wing, by a laterally compressed bill, by a bony crest, by pendent wattles on the naked neck, and by three toes on each foot, all furnished with claws, the inner toe short, and armed

with a very long and sharp claw. There are also very important anatomical differences in its digestive organs, which are not adapted to the same coarse diet, for the C. "has short intestines and small coeca, wants the intermediate stomach between the crop and gizzard, and its cloaca does not proportionally exceed that of other birds." Only one species is known, *casuarius galeatus*, sometimes called emu by the older naturalists, before that name was appropriated to the Australian bird which now alone receives it. The C. is a native of the Moluccas, New Guinea, and other Asiatic islands, chiefly inhabiting deep forests. In general appearance, it is not unlike the ostrich, but has a much shorter neck. It is the largest known bird except the ostrich, and its height, when erect, is about 5 feet. It feeds on fruit, eggs, and succulent herbage. When attacked, it defends itself by kicking obliquely backwards with its feet, and by striking with its short wings, the rigid barbless shafts of which, although useless even to aid it in running, are not without value as weapons. There are only about five of them in each wing, somewhat resembling the quills of a porcupine; and at the end of the last joint of the wing there is a spur. The color of the C. is brownish black; the feathers are loosely webbed, and hang down, so that, at a little distance, the bird seems clothed with hair. Those of the rump are 14 in. long, hanging down in place of a tail. The head and upper part of the neck are naked and of a bluish color, and there are two pendent wattles, partly red and partly blue, on the front of the neck. On the breast is a callous bare part, on which the bird rests its body on the ground. The bony crest or helmet reaches from the base of the bill to the middle of the crown, and is about 3 in. high, exhibiting the most intense blue, purple, ard scarlet blended together. The C. lays a few eggs, which it leaves to be hatched by the heat of the sun; and which are greenish, and have a much thinner shell than those of the ostrich. Its flesh is black, tough, and juiceless. The C. is not unfrequently to be seen in menageries in Europe, but is becoming more rare in its native regions, in which it is sometimes kept tame.

CAST, an impression produced by pouring a ductile substance, such as plaster of Paris, into a mold. This method was employed by the ancients in multiplying not only objects of art, such as the small household statues of the gods, but articles of direct utility. Thes so-called *Celts*, or chisels of bronze, which, with the molds for casting them, are found in England, Ireland, and France, testify to the fact that the art of casting from a mold is one of the earliest acquired by semi-civilized nations. Casts are of incalculable value in familiarizing the eyes of those who can never look on the originals with the grand and beautiful forms of antique art. The best to be had in this country are those executed, and sold on application, at the British Museum. Casting, when applied to metals, is called founding (q.v.).

CASTAGN'O, Andrea del, 1390–1457; a painter of the Florentine school, who imitated the naturalists of the time in boldness of attitude, but was deficient in grace and coloring. For several centuries, C. rested under the imputation of having murdered his colleague, Domenico Venezaino, in order to monopolize the then recent secret of oil painting as practiced in Flanders by the Van Eycks; but the charge has been proved untrue, as Domenico outlived C. by four years. One of C.'s extant works is an equestrian figure in the Florentine cathedral.

CASTA'LIA, a fountain on the slope of Parnassus, a little above Delphi, in Phocis, sacred to Apollo and the Muses. It was the "holy-water" of the Delphian temple; and all who came to consult the oracle, or visited the place with any religious purpose whatever, were wont to bathe their hair *rore puro Castaliæ* (in the pure dew of C.), but those who wished to be purified from murder bathed their whole body. The Roman poets feigned that its waters filled the mind of those who drank of it with poetic inspiration. It was imagined to have some connection with the river Cephisus, and to flow from the subterranean Styx. The fountain, whose waters are still pure and delightful as in the days of classical antiquity, now bears the name of St. John, from a small chapel of that name close by.

CAS'TANETS, a musical instrument of percussion in the form of two hollow nut-shells, which are bound together by a band fastened on the thumb, and struck by the fingers to produce a trilling sound in keeping with the rhythm of the music. The *krotalon* of the ancients was somewhat similar. The C. were introduced into Spain by the Moors, where they retain the name of castanulas, from their resemblance to the form of the chestnut. The C. are now much used in the ballet and in the opera.

CASTA'NEA. See Chestnut, *ante.*

CASTA'ÑOS, Don Francisco Xavier de, Duke of Baylen, a celebrated Spanish general, was b. at Madrid in 1756, and studied in Germany the military tactics of Frederick the great. For some time after his return to Spain, he had no opportunity of acquiring distinction; but when Napoleon I. invaded that country, C. received the command of a division of the Spanish army, and on the 22d of July, 1808, compelled 20,000 French, under gen. Dupont, to surrender at Baylen. It is asserted, however, that the merit of this prodigious success belonged more to Aloys Reding, a Swiss by birth, and the second in command. In Nov. of the same year, C. was in turn defeated by the French at Tudela. The arrival of Wellington necessarily reduced him to a subordinate position, but he took part in the important battles of Albuera, Salamanca, and Vittoria. In 1811,

he was appointed general of the 4th Spanish *corps d'armée*, and commandant of several provinces. In 1815, he was placed at the head of 80,000 troops, destined to invade France, some of which had already crossed the frontier when the news came of the battle of Waterloo. Although no great favorite with the court politicians, his talents could not be overlooked. In 1825, he was called to the state council, where he became a decided opponent of the Carlist party. He died 24th Sept., 1852, at the advanced age of 96.

CAST—CASTING-LINE. The casting-line, in angling, is a gut-line on which the artificial flies are fastened. It is made up of several lengths of gut, knotted together, and, usually from 2 to 4 yards long. The flies are attached at intervals of about 2 ft., and the line with its flies is called a *cast*. The term *cast* is also applied to a part of a stream where certain fish may be taken, as a trout-cast, a salmon-cast.

CASTE, a term applied chiefly to distinct classes or sections of society in India, and, in a modified sense, to social distinctions of an exclusive nature among the nations of the west. When, at the end of the 15th c., the Portuguese began to penetrate to India by the cape of Good Hope, and to trade with the Deccan or southern portion of the Indian peninsula, they found arbitrary social laws, full of intricate regulations which constantly interfered with their intercourse with the natives, especially in matters involving the *subdivision of labor*. They found certain pursuits invariably followed by a certain class, and any attempt to induce a man to perform offices not appointed for the class of which he was a member, met with violent opposition, though such offices might, according to European notions, be more honorable than many he was content to fulfill. They observed, also, that these different classes often varied in appearance, the result, in some cases, of their addiction for many generations to the same pursuits; in others, of their having actually arisen from a different stock. Hence they applied to these various divisions of society the term *casta*—a Portuguese and Spanish word, meaning a breed. As applied to these classes of Hindu society, the word has passed into most European languages. From its frequent use in India, it has sometimes been erroneously considered of Hindu origin.* Of late, it has been spelled *caste*, but by old authors *cast;* and it is even a question whether the word may not be as genuine English, as *casta* is Spanish.

In the s. of India, the Portuguese became acquainted with what is considered the most exaggerated evil of caste. There are found there large numbers of a class called *pariahs*, or, in other districts of India, *chandalas*. They are probably the relics of some early conquered race, who have been degraded by uninterrupted ages of oppression, as is represented to have been the case with the Helots of Sparta, and people in a similar condition. These pariahs were always identified with outcasts—i.e., persons who had forfeited the privileges of their original order. No one of any C. would have any communication with them. If one of them even touched a Nayr, or warrior of high C., he might with impunity kill him. Some sorts of food were defiled by even their shadow passing over them; and the name of Pariah or Chandala conveyed to the Hindu the idea of the utmost vileness and disgust. All who violated the institutions of their class were held to sink into this class—a condition which involved the loss of all human respectability and comfort. These regulations were, moreover, referred to religion.

As India was at this time the land of the marvelous, and its inhabitants, though as various as the different nations of Europe, viewed as one homogeneous people, what was only true of one portion of the peninsula, was considered as prevailing everywhere, and as identical with the divisions of the Indians into *seven* tribes or castes, mentioned in olden times by Strabo, by Diodorus Siculus, and by Arrian. Nor was it forgotten that the Egyptians, whose early civilization was as undoubted as that of India, were also divided, according to Herodotus, into seven classes of priests, warriors, herdsmen, swineherds, tradesmen, interpreters, and pilots, to each of which were assigned particular districts.

About the middle of the 16th c., however, Abraham Roger, chaplain of the Dutch factory at Pulicat, gained the confidence of a Brahman, acquainted with the Sanscrit language, and by this means learned pretty exactly the account of the origin of C. given in the *Laws of Menu*, a work inferred to have been written not later than 900 B.C., which was long known only by name in Europe, until about the end of the last century, when a copy was obtained, and translated by sir William Jones. The whole of the Hindus are represented by Menu as divided into four classes:

1. The *Brahmans*, or *sacerdotal class*, who are said, at the moment of creation, to have issued from the *mouth* of Brahma. Their business is reading and teaching the Vedas, and the performance of sacrifice for themselves and others. They are to be the chief of all created beings; the rest of mortals enjoy life through them. By their imprecations, they can destroy kings, with all their troops, and elephants, and pomps. Indra, when cursed by one of them, was hurled from his own heaven, and compelled to animate a cat. Hence, the Brahman is to be treated with the most profound respect, even by kings. His life and person are protected by the severest laws in this world, and the most tremendous denunciations for the next. His own offenses are treated with singular lenity; all offenses against him, with terrible severity. He is forbidden

* In Sanscrit, castes are called *varnas*, i.e., "colors;" color being, no doubt, the chief distinction at first.

to live by service, but on alms; and it is incumbent upon virtuous men and kings to support him with liberality; and all ceremonies of religion involve feasts and presents to him. The first part of his life is to be devoted to an unremitting study of the Vedas —books, be it observed, older than the code of Menu, and yet, except, perhaps, one of the later hymns, containing no mention of C. as a religious ordinance. He is to perform servile offices for his preceptor, and beg from door to door. In the second quarter, he lives with his wife, reads and teaches the Vedas, assists at sacrifices, and, "clean and decent, his hair and beard clipped, his passions subdued, his mantle white, his body pure, with a staff and a copy of the Vedas in his hand, and bright golden rings in his ears," he leads a studious and decorous life. The third quarter of his life he must spend in the woods, as an anchorite, clad in bark, without fire, wholly silent, and feeding on roots and fruits. The last period he is released from external forms and mortifications, and is to spend his time meditating on the divinity, until at length he quits the body, "as a bird leaves the branch of a tree, at pleasure."

2. The *Kshatrya*, or *Chuttree*, or *military class*, sprang from the *arm* of Bramha, and bear something of a sacred character. It is stated that the sacerdotal order cannot prosper without the military, or the military without the sacerdotal; and the prosperity of both, as well in this world as in the next, is made to depend on their cordial union. The Kshatrya are to give alms, to sacrifice, to read the Vedas, and defend the people. Though Brahmans are to draw up and interpret laws, they are carefully excluded from administering them. The *executive* government is vested in the Kshatryas alone.

3. The *Vaisya*, or *Bais*, or *mercantile class*, sprang from the *thigh* of Brahma. Their grand duties are to keep cattle, carry on trade, lend on interest, cultivate the soil, and turn their attention to every description of practical knowledge. They are to be perfect men of business.

The *Sudras*, or *Sooders*, or *servile class*, came from the *foot* of Brahma. They are to serve the three superior classes, more especially the Brahmans. Their condition is never to be improved; they are not to accumulate property, and are unable by any means to approach the dignity of the higher classes. Utter and entire submissiveness to the Brahmans is the spirit of all the Sudra's duties, and this is to be enforced by penalties as severe as they are ridiculous. Yet, withal, the Sudras were not to be slaves, either public or private, and to occupy a position much higher than the Chandalas.

Mixture of castes, though not absolutely forbidden, entails disadvantages on the children, and the offspring of a Brahmanical woman and a Sudra becomes a Chandala, or outcast.

Such—omitting the minute and childish laws and penalties, many hundreds in number, by which it is proposed to carry the principle of C. into the pettiest affairs of life—is a brief outline of it, as gathered from the code of Menu. There is no historical evidence that it ever existed in this form, and, from the nature of the case, we may conclude that it never did. In the *Toy-cart*, the oldest Hindu drama, no extravagant veneration for Brahmans anywhere appears. In fact, one of them is condemned to death; and the arrangements of society appear to have been the same as at present. The laws of C. form, it is true, a part of what is reputed to be Hindu law, but they have remained in all the states of India, Hindu as well as Mohammedan, to a great extent a dead-letter. There is nothing to show that the code of Menu was drawn up for the regulation of any particular state. Some have even conjectured that it may have been the work of some learned man, designed to set forth his idea of a perfect commonwealth under Hindu institutions, just as Plato in *The Republic* gives us his idea of a model government under Greek institutions.

Be this as it may, the C. which at present exists throughout the greater part of India is very different from that described in the code of Menu, though to this it owes, no doubt, much of its stability and its importance in the eyes of Europeans. With the exception of the Brahmans, the pure castes have disappeared, and out of the intermixture of the others have sprung innumerable classes, many of them unauthorized except by the people themselves. So ingrained in the whole community is this tendency to class distinctions, that Mussulmans, Jews, Parsees, and Christians fall, in some degree, into it; and even excommunicated or outcast Pariahs form castes among themselves. Most of the existing castes partake of the nature of associations for mutual support or familiar intercourse, and are dependent upon a man's trade, occupation, or profession. Many of them have been described by Mr. Colebrook in the *Asiatic Transactions*, vol. v. Many have had their origin in guilds, in schism from other castes, in the possession of a particular sort of property (as, for instance, landlords are spoken of as the C. of *zemindars*), and similar accidental circumstances. Their names are often due to the district in which the C. took its rise, to their founder, to their peculiar creed, or any random circumstance. In the Bengal presidency, there are many hundreds of such castes, almost every district containing some unknown in those adjacent. Among the lowest classes, and especially among the servants of the English at Calcutta, it has degenerated into a fastidious tenacity of the rights and privileges of station. For example, the man who sweeps your room will not take an empty cup from your hand; your groom will not mow a little grass; a coolie will carry any load, however offensive, upon his head, but even in a matter of life and death, would refuse to carry a man, for that is the business of another caste. Such and many other regulations are described in

every work on C., but are as unworthy of serious regard as are the assertions of self-importance found among little people all the world over. When an English servant pleads that such a thing "is not his place," his excuse is analogous to that of the Hindu servant when he pleads his caste. When an Englishman of birth or profession, which is held to confer gentility, refuses to associate with a tradesman or mechanic—or when members of a secret order exclude all others from their meetings—or when any other similar social distinction arises, it would present itself to the mind of the Hindu as a regulation of caste.

Nor does C., at the present day, *tie a man down to follow his father's business,* except, perhaps, in the case of the more sacred functions of the Brahmans. For the rest, Brahmans serve as soldiers, and even as cooks. Men of all castes have risen to power, just as in England our statesman have sprung from every class of society. Nor, again, is loss of C. anything so terrible as has been represented; in most cases, it may be recovered by a frugal repast given to the members of the C.; or the outcast joins another C., among whom he will commonly be received with the heartiness due to a new convert. The question of the restoration of a Christian convert wishing to rejoin the Brahmanical C., has been differently decided by his fellow caste-men in different places.

As in the west, so in the east, C. enters into all the most ordinary relations of life, producing laws often most tyrannical and too anomalous to admit of generalization. In the west, however, whilst good sense and Christianity have ever tended to ameliorate social differences, the feeble mind of the Hindu and the records of his religion have had a contrary effect.

These modified views of C., which have begun to prevail in recent years, will be found more fully developed in Shore *On Indian Affairs,* Irving's *Theory and Practice of Caste.* Full accounts of the petty regulations of C., as laid down in the code of Menu, may be seen in sir William Jones's *Translation of the Code of Menu,* Robertson's *Disquisition on India,* Richard's *India,* Elphinstone's *History of India,* Dubois's *India,* Colebrooke's *Asiatic Transactions,* vol. v., and in various articles in the *Calcutta Review.* The most authoritative account of the subject of caste is to be found in the first volume of Dr. John Muir's *Original Sanscrit Texts on the Origin and Progress of the Religion and Institutions on India; collected, translated into English, and illustrated by Notes* (5 vols., Lond. 1867–71; vols. 1 to 4, new ed.), a work of the utmost value.

The question how C. is to be dealt with in converts to Christianity, has now been determined by common consent of missionaries in India; and it receives no recognition within the Christian church. An opposite policy, in former times, founded on the opinion that C. might be regarded as merely a civil or social institution, and not as a part of the religion of the Hindus, is now believed to have been among the principal causes of the comparative decay of the churches or congregations founded during the 18th c. in the s. of India.

CASTEG'GIO, or MONTEBELLO, a t. of Piedmont, northern Italy, 5 m. e.n.e. of Voghera. In the campaign of 1859, C. was occupied by Austrians prior to the battle of Montebello, in which they were defeated by the French and Sardinians. C. was also valorously but unsuccessfully defended by the Austrians in the great battle of Montebello between them and the army of Napoleon I. in 1800. As *Castidium,* C. was an important military position as early as the times of the Gallic and Punic wars. Some Roman antiquities still remain, and numerous curious inscriptions and coins have been found. Pop. 3,206.

CASTEL' (from the Latin *Castellum*) is a name prefixed to various places in Italy, France, Spain, Portugal, etc., of which the most important are:

1. CASTEL-ARQUATO, a t. of Parma, n. Italy, 19 m. s.e. of Piacenza, picturesquely situated amid forests and vineyards, with a fine Gothic church and a noble old castle, from which the town derives its name. It has manufactures of silk, and a pop. of 4,400.

2. CASTEL-BOLOGNESE, a t. of n. Italy, about 22 m. w.s.w. from Ravenna. It derives its name from a strong fortress built here by the Bolognese in the 14th c.; and is historically famous as the scene of a decisive battle between the Milanese and Florentines in 1434, in which the latter were completely vanquished.

3. CASTEL-BUONO, a t. of Sicily, in the province of Palermo, 8 m. s.e. of Cefalu. It is noted for its mineral springs, and has a trade in manna. Pop. 5,288.

4. CASTEL-FRANCO, a t. of central Italy, 8 m. e. of Modena, with the old walls and ramparts of a castle built by Urban VIII., and near the site of the battle between the consuls Hirtius and Pansa and Mark Antony.—Also the name of a town of Italy, in the government of Venice, about 25 m. n.w. from the city of that name, with linen and woolen manufactures, and a pop. of 4,220.

5. CASTEL-GANDOLFO, a village of the former Papal states, 11 m. s.e. of Rome, near the w. shore of lake Albano. Its situation is extremely picturesque, and it commands extensive views of some of the most beautiful scenery in Italy. The pope has his summer residence here. In early times, the noble family of the Savelli had a stronghold at C., by means of which, for a period of nearly 400 years, they bade defiance to popes, barons, and *bourgeoisie.* Pop. 1144.

6. CASTEL-SARDO (formerly *C. Aragonese*), a fortified t. and seaport, the strongest

on the island of Sardinia, is situated on a steep rock on the n. coast, 16 m. n.e. of Sassari. The environs produce wine. Pop. 1946.

7. CASTEL-SARRASIN, a t. of France, in the department of Tarn et Garonne, on the Songuine, 12 m. w. from Montauban. It has the remains of an old castle said to be of Saracenic origin, a pop. in 1876 of 3,547, manufactures of serge and worsted stockings, and a trade in the agricultural produce of the district.

8. CASTEL-TERMINI (ancient *Camicianæ Aquæ*), a t. of Sicily, in the province of Girgenti, and 16 m. n. from the city of that name. It has extensive mines of rock-salt and sulphur, and a pop. of 8,200.

9. CASTEL-VETRANO, a t. of Sicily, in the province of Trapani, 20 m. s.e. of the town of that name. It is an interesting place, with an old castle, several convents, manufactures of articles of coral and alabaster, and a pop. in 1872 of 20,420. Some of the most esteemed white wine of Sicily is produced in the vicinity.

CASTELAR', EMILIO, b. 1832; an author, statesman, and president of the Spanish republic. He was the son of a broker, and at the death of his father was left in poverty, but managed to secure a good education. He came before the public as a writer of novels, more prominently as an advanced liberal in politics. In 1856, he obtained the professorship of history in the university of Madrid, but lost the place in 1864, in consequence of joining Carrasen in the establishment of *La Democracia*, a radical journal. The paper was suppressed in 1866, and C. was sentenced to death for participation in the disturbance of June in that year; but he escaped to Switzerland, and subsequently went to France. At the beginning of the revolution in 1868 he went back to Spain and resumed his professorship, and in 1869 was one of the few republicans returned to the cortes. In that body he advocated republicanism and vigorously opposed the prospect of a regency. In the government chosen by the cortes after the abdication of Amadeo, C. was made minister of foreign affairs. In Aug., 1873, he was elected president of the cortes, but vacated the post when, Sept. 6, he was nominated for president of the executive power. His first act was to prorogue the cortes and assume complete authority. He made energetic but ineffectual efforts to suppress the Carlists, and sent the minister of war to Cuba, in person to protect Spanish interests in that island. When the cortes re-assembled, Jan. 2, 1874, a vote of confidence in president C. was defeated, and he at once resigned. Thereupon, Pavia, as capt.gen. of Madrid, forcibly dissolved the cortes and appointed a provisional government with marshal Serrano at its head. Soon after the pronunciamento in favor of Alphonso XII., Dec. 13, 1874, C. went to Switzerland, whence in Mar., 1875, he sent back his resignation of the chair of history in the university of Madrid. Among his writings are novels, poems, works on politics, slavery, the war in Africa, *Old Rome and New Italy* (translated into English), parliamentary discourses, etc. His oratory is vigorous and elegant.

CAS'TELL, EDMUND, 1606–85; an English orientalist who spent 18 years in compiling a lexicon of Hebrew, Chaldee, Syrian, Samaritan, Ethiopic, Arabic, and Persian. He spent from 16 to 18 hours a day on the work, and had 14 assistants. The outlay was $60,000, which reduced him to poverty, but his losses were in part compensated by a number of preferments, among them that of prebend of Canterbury. C. assisted Dr. Walter in the preparation of the polyglot Bible.

CASTELLAMA'RÉ, a fortified city and seaport of s. Italy, about 17 m. s.e. of the city of Naples. It is built on the lower slopes of Monte d'Auro, and along a sheltered beach on the s.e. side of the gulf of Naples, over which it commands a magnificent view. It is on or near the site of the ancient *Stabiæ*, which was desolated by Sylla during the social war, and where the elder Pliny afterwards lost his wife when the city was overwhelmed with lava from Vesuvius. Some ancient remains have been found here. The town was sacked in the 15th c. by pope Pius II., and again in the 17th c. by the duc de Guise. It has a royal palace, a cathedral, several convents, among which that founded by Gonsalvo de Cordova, in the 16th c., is famous for the possession of an image of the Madonna found in a well in the 11th c., which is greatly venerated by the peasantry, who make an annual pilgrimage to the church. The old castle, which gave name to the town, was built in the 12th century. C. has a royal dockyard, affording employment to many of the inhabitants, and manufactures of linen, silk, cotton, leather, and sail-cloth. Pop. 20,488.—CASTELLAMARE is also the name of a town in Sicily, situated at the head of a gulf of the same name, and 20 m. e. from Trapani. It has a population of 11,280, and exports of cotton, wine, fruit, and manna.—C., GULF OF, is an extensive bay on the n. coast of Sicily. Its width from e. to w., between point Uomo Morto and cape St. Vito, is about 15 m.; and its depth about 14 miles. It has deep water and good anchorage, but is much exposed to n. winds.

CASTELLAMON'TÉ, a t. of n. Italy, in the province of Turin, 10 m. s.w. of Ivrea. It has an old castle, manufactures of earthenware, and a trade in the agricultural produce of the district. Pop. 5,641.

CASTELLAN, or CHÂTELAIN, the keeper of a castle or *burg* in the middle ages. The office and the rank of the C. were various in various countries. In France and Flanders, the title C. belonged to the holders of certain demesnes, and was next in order of rank to that of a bailiff. In Germany, the C. had the jurisdiction of a burg-graf during the

ages of chivalry. In Poland, the title of C., with its appendages, remained in later times, and, after the 16th c., the castellans, with the waiwodes and bishops, formed the senate or superior legislative chamber.

CASTELLA'NA, a t. of s. Italy, in the province of Bari, and 26 m. s.e. of the city of that name. Its trade is confined to the produce of the district. Pop. 9,691.

CASTELLANETA, a t. of s. Italy, in the province of Lecce, 20 m. n.w. of Taranto. It has a cathedral and several convents. Cotton is grown in the district. Pop. 8,358.

CASTELLAZ'ZO, a t. of n. Italy, about 5 m. s.w. of Alessandria. Pop. 5,749.

CASTELLEO'NÉ, a t. of Lombardy, n. Italy, situated near the Oglio, about 12 m. n.n.w. of Cremona. It is surrounded by old walls, has a fine church, and a population of 5,700.

CASTELLIO, or **CASTALIO,** SEBASTIANUS, a theologian, b. in Dauphiné in 1515. His proper name was *Châteillon,* which he Latinized, according to the usage of his time. About 1540, he was invited to Geneva, by Calvin, and appointed humanity professor; but having the misfortune, afterwards, to differ from the reformer in religious opinion, he was banished from the city, and went to Basel, where he spent the rest of his life in great poverty. He died in 1563. See CALVIN.

Among his various writings may be mentioned *De Hæreticis,* etc.—a treatise which argues against the right of the magistrate to punish heretical opinions, and which produced a rebly from Beza; a Latin version of the Old and New Testaments, published in 1551, and dedicated to Edward VI. of England; and a posthumous work, in dialogue, on predestination, election, free-will, and faith, first published by Faustus Socinus in 1578.

CASTEL'LO, GIOVANNI BATTISTA, 1500–69; an Italian historical painter of the Genoese school. His best known works are the "Martyrdom of St. Sebastian," and "Our Savior as Judge of the World." He was also an architect and sculptor.

CASTEL'LO, VALERIO, 1625–59; a son of Giovanni Battista, who excelled his father in painting, especially in cattle scenes. He decorated the cupola of the church of the Annunciation, in Genoa, and painted the "Rape of the Sabines," in the Brignole palace in that city.

CASTELLON', a province in e. Spain, on the Mediterranean, 2,447 sq.m.; pop. '70, 296,222. It is a rough and mountainous region, containing many mines, and mineral springs. A railroad runs through the province parallel with, and not far from, the sea. The chief town is Castellon de la Plana, near the Mediterranean, 40 m. n.n.e. of Valencia, with which there is railroad connection; pop. 20,123.

CASTELLON DE LA PLANA, a t. of Spain, capital of the province of the same name, is situated in the midst of a fruitful plain, about 4 m. from the Mediterranean, and 40 m. n.n.e. of Valencia. A magnificent aqueduct supplies the means of irrigation. C. is surrounded by walls, and is for the most part well built. It has some handsome old churches, and a singular bell-tower, 260 ft. high. Ribalta, the celebrated Spanish painter, was a native of Castellon de la Plana. It has manufactures of linen, woolen, sail-cloth, paper, earthenware, and fire-arms; also brandy distilleries, and an active trade. Pop. 20,000.

CASTELNAU', MICHEL DE, SIEUR DE LA MAUVISSIÈRE, 1520–92; a French soldier and ambassador to the court of queen Elizabeth. He was thoroughly educated, traveled much, and served in the French army in active service in Italy, where his courage and ability secured for him the friendship of the cardinal of Lorraine, who took him into his service. In 1557, he was given a command in the navy, but soon rejoined the French army in Picardy. He executed several delicate diplomatic commissions so satisfactorily to the constable de Montmorency that he was sent by the king to Henry II. of Scotland with dispatches for Mary Stuart, who was then betrothed to the dauphin (afterwards Francis II). He went also to England and treated with Elizabeth respecting her claims in Calais, a settlement of which was made at the congress of Cambray. Afterwards he was sent to Margaret of Parma, governess of the Netherlands, and later still to Rome to ascertain the views of the pope with regard to France. Returning to France he again entered the navy and had the fortune to discover the earliest symptoms of the conspiracy of Amboise. After the death of Francis II. he accompanied the queen (Mary Stuart) to Scotland, remaining a year, during which time he made several journeys to England and attempted to bring about a reconciliation between Mary and Elizabeth, but his wise and temperate counsels were disregarded. In 1562, he retired to France in consequence of the civil war, and was employed against the Protestants of Brittany, by whom he was taken prisoner, but was soon afterwards exchanged. He served at the siege of Rouen and at the battle of Dreux, took possession of Tankerville, and contributed in 1563 to the recapture of Havre from the English. Within the next ten years he was employed in a number of important missions; first to queen Elizabeth to negotiate a peace; next to the duke of Alva, the new governor of the Netherlands, on which occasion he discovered the project formed by Condé and Coligny to seize and carry off the royal family (1567). After the battle of St. Denis he was again sent to Germany to solicit aid against the Protestants, and on his return was made governor of St. Dizier. In 1572, he was sent to England by Charles IX. to allay the excite-

ment caused by the massacre of St. Bartholomew, and in the same year was sent to Germany and Switzerland. Two years later he was sent by Henry III. as ambassador to queen Elizabeth's court, where he remained ten years. While on this duty, with a view of strengthening and maintaining the alliance between the two countries he used his influence to procure the marriage of Elizabeth with the duke of Alençon; but Elizabeth made so many promises, only to break them, that C. at last refused to transmit them to his government. On returning to France he was out of favor with the league, lost his governorship of St. Dizier, and was reduced to extreme destitution; but on the accession of Henry IV. he was, though a Roman Catholic, intrusted with many important missions. The memoirs of C. are valuable for their accuracy and impartiality.

CASTELNAUDARY, a t. in the department of Aude, France, situated on a declivity, skirted at the base by the canal du Midi, 22 m. from Carcassone. Pop. '76, 7,628. It has manufactures of woolen and silk fabrics, and earthenware, and carries on a lively trade in agricultural produce. The canal at this point expands into a large basin, which serves as a haven. It suffered dreadfully in the crusade against the Albigenses, and was, in 1212, the scene of a battle between Simon de Montfort and Raymond, count of Toulouse. In 1355, it was captured by the black prince. In 1632, marshal Schomberg here gained a victory over the party of the duke of Orleans, when the brave duke of Montmorency was taken prisoner, and afterwards executed at Toulouse.

CASTELNUO'VO, a seaport t. of Dalmatia, Austria, situated near the w. entrance of the gulf of Cattaro. It is surrounded by walls, and defended by two forts and a citadel. It has manufactures of brass, and a trade in the produce of the district, which is fertile. It was captured by the British in 1814. Pop., including commune ('80), 7,188.

CAS'TI, Giovanni Battista, 1721–1803; an Italian poet of humble origin, who rose to the dignity of a canon in the church, but preferred, to further preferment, a life of travel to the gay cities of Europe. In 1782, on the death of Metastasio, he was appointed poet-laureate of Austria, in which position he devoted himself to comic operas. His best known work is *Gli Annimali Parlanti*, freely used in W. S. Rose's *Court and Parliament of Beasts*. On the whole, his poems are harmonious and pure in style, lively and sarcastic, but without originality of plot, and often grossly licentious.

CASTIGLIO'NÉ, a t. of Sicily, province of Catania, on the n. slope of Mt. Etna, on the right bank of the Cantara, 35 m. s.w. of Messina. The town stands on a square rock rising abruptly from the valley, and having a double crest, on which stand a domed church and the ruins of a feudal castle. Here, in 1297, in the war of the Vespers, admiral Roger Toria raised the standard of rebellion against his sovereign, Frederick of Aragon. In the district are several large nut-plantations, which produce the best Sicilian hazel-nuts. Pop. 8,000.

CASTIGLIO'NE, a village on the site of the old city of Gabii, in Italy, 10 m. e. of Rome. The place is noted for ruins of a temple to Juno, a theater, the ancient walls, and other relics of the past.

CASTIGLIO'NÉ, Lake of, a lagoon of central Italy, in the province of Siena. It lies n. of Grosseto, and has a length of about 10 m., with a breadth of from 1 to 3 miles. Receiving the waters of the Bruna and other rivers, it discharges its waters, by a short canal, into the Mediterranean.

CASTIGLIO'NE, Baldasar're, Count, one of the most elegant of the old Italian writers, was b., 1478, at Casatico, in the duchy of Mantua, and studied at Milan. His shining talents, knowledge, and pleasing manners made him a favorite of Guidobaldo di Montefeltro, duke of Urbino, a great patron of literature, at whose court he was honorably entertained, along with other men of eminence in letters. He was employed by the duke as envoy to Henry VIII. of England, who made him a knight; and was afterwards sent in the same capacity to Louis XII. of France, under Guidobaldo's successor, in several important ambassadorial missions. He died at Toledo in 1529. His chief work is the book *Del Cortegiano*, a manual for courtiers, remarkable for its elegant style. His Italian and Latin poems are also models of elegance, and his *Letters* (2 vols., Padua, 1769–71) contain interesting contributions to the political and literary history of his time. Tasso devoted a sonnet to the death of C., and Giulio Romano raised to his memory a monument in Padua.

CASTIGLIO'NE, Carlo Ottavio, Count, an eminent Italian philologist, was b. at Milan in 1795. At an early period, he displayed a predilection for antiquarian studies, more particularly numismatics. When only 24 years of age, he published a description of the Kufic coins in the cabinet of Brera, at Milan, under the title, *Monete Cufiche del Museo di Milano* (Milan, 1819), which showed a great knowledge of oriental languages and history, C.'s principal work in the sphere of oriental literature is his *Mémoire géographique et numismatique sur la Partie orientale de la Barbarie appelée Afrikiah par les Arabes, suivi de Recherches sur les Berbères Atlantiques* (Milan, 1826), in which he seeks to ascertain the origin and the history of the towns in Barbary whose names are found on Arabic coins. Out of Italy, C. is perhaps best known by his edition of some fragments of the Mœso-Gothic translation of the Bible by Ulphilas (q.v.), which had been discovered, in 1817, by cardinal Mai among the palimpsests of the Ambrosian library. At

first, he published some specimens in conjunction with Mai, but in 1829, 1834, 1835, and 1839, appeared a variety of fragments of the Pauline epistles, edited by himself, and enriched with valuable disquisitions, commentaries, and glossaries. He died at Genoa, April 10, 1849.

CASTIGLIO'NE, GIOVANNI BENEDETTO, 1616–70; a Genoese painter who studied for some time under Vandyke. He excelled in depicting fairs, markets, and rural scenes, and painted portraits and historical pieces. He also made many etchings which were remarkable for light and shade. Among the most famous of his paintings was "The Nativity of Jessus," in the church of San Luca at Genoa. His brother Salvatore, and his son Francesco, excelled in similar subjects.

CASTIGLIO'NE, GIUSEPPE, 1698–1768; an Italian Jesuit missionary who labored many years in Pekin and other parts of China. He was also an artist of ability, and it is said that the emperor Kien-Long erected several palaces from his designs.

CASTIGLIO'NÉ DEL'LÉ STIVIE'RÉ, a t. of n. Italy, 22 m. n.w. of Mantua. It is walled and defended by an ancient castle; but is chiefly celebrated on account of the victory obtained here by the French over the Austrians in 1796, and which gave the title of duc de Castiglione to marshal Augereau. Pop. 3,716.

CASTILE' (Spanish, CASTIL'LA) forms, in a geographical and political point of view, the central district of the Spanish peninsula, being the middle and most strongly marked plateau of Spain, as well as the central seat of the monarchy. Both geographically and politically it is divided into Old and New Castile—*Castilla la Vieja* and *Castilla la Nueva*. The former district, situated in 40° 5′ to 43° 32′ n. lat., and 1° 40′ to 5° 35′ w. long., rises, in the form of an elevated plateau, to the height of 2,500 to 3,000 feet. It is walled in on all sides: on the n., by the highest masses of the Cantabrian mountains, which separate it from the Basque provinces and Asturias; on the s., by the high ridge forming the water-shed between the Douro and the Tagus; while the Sierras de Oca, de Urbion, and Moncayo, and the heights of Leon and Tras-os-Montes bound it on the e. and west. The high plateau of Old C. is but scantily watered, and its natural characteristics far from inviting. In many parts, nothing is presented to the eye but a wide, unwooded, almost treeless waste of land, unrefreshed by streams, in some parts monotonously covered with stunted grasses, and in others almost destitute of vegetation. The traveler may walk many miles without finding a village, or even a solitary farm-house. All Old C., however, is not a dusty desert. There are rich tracts in it producing some of the finest wheat in the world. Madder and grasses are also produced abundantly in some parts; and even the olive flourishes where it is protected from the frost and snow of winter, and from the cold winds prevailing in Oct. and the following months. Iron and other minerals exist in plenty, but are not worked to any great extent. Sheep, cattle, pigs, and mules form the chief wealth of the inhabitants. Manufactures consist of coarse woolens, cotton, linen, leather, and glass.

The plateau of NEW CASTILE—which is situated between lat. 38° 23′ and 41° 15′ n., and long. 1° and 5° 25′ w.—like Old C., is also inclosed by mountains. Though lying 1800 ft. lower than Old C., New C. presents many similar characteristics of soil and scenery. It is mostly sterile, and scantily irrigated; little rain falls, and the nightly dews are insufficient to refresh the plains, which are entirely destitute of trees, and, in summer, appear quite burned up. Olives, corn, pulse, and saffron are cultivated in some neighborhoods; but flocks of sheep constitute the chief wealth of extensive tracts of land. The commerce, carried on by means of long trains of mules, reminds the tourist of the caravan traffic over eastern deserts. Industry is almost entirely restricted to manufactures of coarse woolen goods. The yield of the salt-mines in the s. is considerable; and quicksilver, especially at Almaden (q.v.), and iron (manufactured at Toledo) are plentiful. The Castilians have even more than the general haughtiness of the Spanish character. Their language prevails throughout the educated classes, as in the literature of Spain, and their rulers have extended their sway over the whole nation.

In the present administrative division of Spain into forty-nine provinces, the division of Old and New C., though it will long be remembered by the people, is one belonging to past history. Old C. is now divided into the eight provinces of Burgos, Logroño, Santander, Soria, Segovia, Avila, Palencia, and Valladolid. The population, distributed over an area of 22,797 sq.m., amounted, in 1877, to 1,654,495. New C. includes the five provinces—Madrid, Guadalaxara, Guença, Toledo, and Ciudad Real, and on an area of 30,882 sq.m. has 1,541,772 inhabitants. Besides these provinces, the kingdom of Leon, Galicia, the principality of Asturias, and the districts of Estremadura, Andalusia, Granada, and Murcia, belonged to the crown of Castile.

C. first became an independent country in 762, and remained so until 1028, when it passed to Sancho III., king of Navarre. His son, Ferdinand I. (great), founded the kingdom of C., and among other acquisitions annexed to it the kingdom of Leon. This union, however, was not permanent, Leon being made a separate kingdom for Ferdinand II. The two kingdoms, however, were afterwards reunited in the 13th c. in the person of Ferdinand III., and remained ever after under one scepter. Among the successors of Ferdinand III., the most distinguished was Alfonso X., by whose direction the Alfonsine (astronomical) tables were drawn up. By the marriage of Isabella, sister and successor of Henry IV., with Ferdinand, king of Aragon (1469), the two crowns of C

and Aragon became united (1479), and from these sprang the kingdom of Spain, which, however, was not fully established before the death of Ferdinand, in 1516, when Charles I. of Spain (Charles V. of Germany) inherited both crowns.

CASTIL'LA, Don Ramon, 1797–1867; a Peruvian who entered the Spanish army in 1816, but soon after 1820 joined the revolt against Spanish rule. In 1830, Gamarra made him chief of staff of the whole army, and the provisional president appointed him brig.gen. After the treaty with the president of Bolivia, Castilla went to Chili, and in 1837 joined the Peruvians who marched against Santa Cruz, the president of Bolivia. When the revolutionists proclaimed Gamarra president, Castilla was made minister of war. In 1841, he was one of the leaders of the Peruvian force that invaded Bolivia, and in 1845 he was elected president of Peru. His successor, Echenique, became unpopular, and Castilla started a revolution, overcame Echenique, and became sole ruler of the country. One of his important reforms was the abolition of slavery. In 1858, he was re-elected president, and in 1860, he proclaimed a new constitution which granted universal suffrage and prohibited the exercise of any religion except the Roman Catholic. His last political movement was in 1867, when he led an insurrection against Prado, then president; and he was on his way to Arica when he died.

CASTILLE'JO, Christoval De, 1494–1556; a Spanish verse-writer of great fertility, whose poems were about the last of the old Spanish school before the changes led by Garcilaso de la Vega. Being strongly anti-clerical, Castillejo's writings were usually noted on the Index Expurgatorius, and were smuggled into Spain from foreign printing-houses, while in a later period the agents of the church altered the verses to suit themselves. The works of Castillejo are in three books, one entitled *Love*, one *Conversation and Pastime*, and the third comprising moral and religious verses. He died in a monastery.

CASTILLON, a t. of France, in the department of Gironde, situated on the right bank of the Dordogne, 26 m. e. of Bordeaux. It has manufactures of cotton and woolen yarns, nails, and cordage. It is celebrated as the scene of the battle between the forces of Henry VI. of England and Charles VII. of France, July, 1453, in which the English met with a signal defeat, their leader, the earl of Shrewsbury, and his son, being slain. Of all their possessions in France, Calais alone remained to the English after this battle, the incidents of which were seized on by Shakespeare for the sixth scene in his play of *King Henry VI.*, part i. Pop. '76, 2,766.

CASTINE, a t. in Hancock co., Maine, on the Penobscot, 34 m. below Bangor; pop. '80, 1215. It was here that the baron de Castine settled in 1667 a French colony, which was soon abandoned in consequence of Indian and English wars. In 1760, it was re-occupied by the English, who made a harbor that was always accessible for the largest ships. Castine is now a port of entry, and ship-building and fishing are the employments of the greater portion of the people.

CASTING, in angling, is the term applied to the act of throwing a fly or a fish-bait. In casting a fly with a single-handed rod, the beginner should let out about as much line as the length of the rod; grasp the rod just above the reel; then wave it back over the right or left shoulder, with a slightly circular sweep, so as to extend the line behind; and then bring it forward with a steady cutting kind of action, urging the point of the rod towards the spot where the fly is to fall, taking care not to carry the point of the rod too far forward, or too low, or the line will not fall straight and evenly on the water. The object of the circular sweep behind is to prevent the fly from cracking off. By slightly raising the point of the rod just as the fly is delivered, the line is straightened; and the fly, checked in mid career, falls like thistle-down upon the water. Always allow time for the line to go straight out behind, for if returned too quickly, the fly cracks off. In casting with the double-handed rod, the one hand grasps the rod above the reel, and the other below it, the lower hand acting as a pivot upon which the rod turns.

In casting a bait, either for spinning, trolling, or live-baiting, the bait is suffered to hang from the point of the rod about a yard. Taking the rod in both hands, the line clasped to the rod in his right, the angler waves the bait gently back; and having first drawn as much line as he requires off the reel, and laid it loosely at his feet, he sends the bait forward with a swing towards the point he desires to reach.

CASTING. See Founding, *ante*.

CASTING-NET, a species of net very widely distributed, having been found in use amongst various savage tribes in different parts of the world, some of whom, from long and constant practice, use it with a dexterity and address unknown in England. The nets used in England are usually from 13 to 20 ft. in circumference when spread out. They are netted in the shape of a kind of long loose bag or cone; and so much is the number of meshes increased as the net progresses, that it is capable of being spread out in a perfectly flat and circular form, the apex of the cone forming the center of the circle. To this apex is attached a rope of some yards in length; when casting, this rope is fastened round the left wrist of the caster. The bottom of the net, which forms, when it is held up by the apex, the base of the cone, or, when spread, the circumference of the circle, is hung around with perforated leads or bullets. These have not only the effect of carrying the net to the bottom of the water, but also, when it is cast, of causing

the net to spread open. The bottom of the net is turned up some 6 in. or more in depth, and hung up on the inside about every 10 in. or so, to an upper portion of the net, by stout strings, so as to form a kind of purse; this is called the "tuck." When the net is required to be cast, the caster, having fastened the rope to his wrist, and coiled it loosely in his left hand, hangs a portion of the net over his left shoulder; and then gathering as much of the outer edge of the net as he can collect in his right hand, and holding it up so as to open the net as much as possible, makes a semicircular sweep of the body and the right hand—rather difficult to accomplish without practice—and whirls the net away off the shoulder. The centrifugal motion thus communicated to the leads, etc., on the bottom of the net, causes it to open like a circle on the surface of the water, the leads carry it to the bottom, and the net thus covers all that comes within its circle. The rope is then pulled gradually, and worked from side to side, in order to narrow the circle, to bring it once more into a cone; and, in their efforts to escape, the fish that may have been covered are gradually driven into the tuck or purse of the net. When the leads are all close together, the net is lifted from the water, and the fish in the tuck are taken out. The cost of a cast-net is regulated by the circumference and the size of the mesh. They may be had from 12*s.* to 30*s.* or more.

CASTING-VOTE, the vote by which the chairman or president of a meeting is generally empowered to *cast* the balance on the one side or the other, where the other votes are equally divided. In the house of commons, the speaker does not vote at all unless this occurrence takes place. As his position in this respect is felt to be a delicate one for a person whose duty it is to withdraw himself from the contentions of party, it is usual for the speaker to vote in such a way as to give the house an opportunity of reconsidering its decision. The same rule prevails in select committees. Following a similar rule, the chairman at corporation and general meetings usually gives his casting-vote either in a way that will lead to a reconsideration of the subject, or for what seems the popular view of the case, although that may be at variance with his convictions.

CAST-IRON, or PIG-IRON. This is the crudest form of iron, and the method of its production is described under the head IRON. There are two leading kinds of it, namely, white pig-iron and gray pig-iron; the former is also called forge-iron, from the fact of its being chiefly used for conversion into malleable iron and steel; and the latter is often called foundry-iron, on account of its suitability for castings. Of each of these, again, there are many varieties; and much light has of late years been thrown on what constitutes their different qualities, by experiments in the manufacture of steel. White cast-iron, when smelted from the argillaceous ores of the coal-measures, is of inferior value to the gray; much of it, indeed, being produced against the will of the iron-master, when the blast-furnace is working badly. But when obtained from pure ores and fuel it is the most valuable kind, because it contains fewer impurities, and has its carbon nearly all in the combined state, in which case it is best suited for the manufacture of wrought-iron and steel. Gray pig-iron contains carbon both in the combined and the uncombined (graphitic) state. In the grayest kind, uncombined carbon greatly prevails, and the fracture of the iron is more distinctly granular or scaly-crystalline than is the case with other varieties. Such cast-iron is usually called No. 1. It is much softer, but fuses at a higher temperature than white pig-iron. It also becomes thinly liquid when melted, and expands slightly just before cooling—properties which render it extremely valuable for castings. As the grayness and graphite-like brightness diminish, the iron is known as No. 2, No. 3, and so on for several numbers, till we come to the close texture and light color of white pig-iron; No. 2 being but slightly different from No. 1, and No. 5 from white-iron, in quality. No. 3 is intermediate between the extremes. When cast-iron is partly gray and partly white, it is called mottled iron. Cast-iron contains from 2 to 5 per cent of carbon, the maximum amount in steel being 2; but steel is practically free from silicon, sulphur, and phosphorus, while cast-iron is not.

CASTLE (Sax. *castel;* Lat. *castellum*, dimin. from *castrum*), a building constructed for the purpose of repelling attack. The root of the word is the same as that of *casa*, a little house or hut, and probably means a driving off or repelling; and it is worthy of notice, in confirmation of this view, that in Welsh the radical syllable *cas* signifies a C., separated, and also hatred, malice, etc. The *castella*, left by the Romans in Britain and elsewhere, were constructed on the general model of their stationary encampments (*astra stativa*), (see CAMP and ENCAMPMENT); and though they may have suggested the castles of the middle ages, they differed from them in being designed for military purposes only, and not also as places of permanent residence. Even Burgh castle, in Suffolk, the ancient Garamonium, and Richborough castle, in Kent, the ancient Rutupiæ, were encampments or fortresses, rather than castles.

Besides these monuments of the military occupation of the island by the Romans, traces are found in various parts of the country of encampments or castles, which are ascribed to its aboriginal or early inhabitants. These are generally situated on the tops of hills; as, for example, the Herefordshire beacon, on the Malvern hills; Moel Arthur, in Flintshire; Chem castle, in Cornwall; the Maiden castle, in Dorsetshire; the Caterthuns, near Brechin, in Forfarshire; the Barmkin of Echt, in Aberdeenshire. It is probable that the Saxons adapted the Roman castles to a certain extent to their modes of defense, and traces of Saxon and even Norman workmanship are found in struc-

tures which are believed to have been originally Roman. One very frequent change consisted in raising a mound of earth on one side of the walls on which the keep or citadel was erected. The Decuman and Prætorian gates were also, as at Portchester, converted into the fortified entrances peculiar to the castellated structures of the middle ages. But of castles designed for residence as well as defense, there are few or none which are of higher antiquity than the conquest. They were part of the organization of the feudal system—castle-guard being one of the duties which the tenants were taken bound to pay in return for their lands; and till that system was developed by the Normans, the residences of persons of importance were probably guarded only by their domestic retainers, or, in extraordinary circumstances, perhaps by the national militia. The absence of strongholds is said to have been a reason why William the conqueror so easily became master of the kingdom; and it was as a protection against the resentment which the conquest occasioned, that most of the great Norman castles of England were built. As these castles grew in strength by the additions and improvements of each generation, they afforded their possessors the means not only of security from their fellow-subjects, but of independence as regarded the central government. The lord of every C. became a petty tyrant; and no small portion of the history of England, and, indeed, of Europe altogether, during the feudal period, consists of an account of the attempts which were made by the monarch to extirpate what Matthew Paris has emphatically designated as "these nests of devils and dens of thieves." Of castles of this description, it is said that in England, in the reign of Stephen (1135–54), no fewer than 1115 were built.

The Norman C., which was the most complete structure of the kind, was generally surrounded by a moat or ditch; and in order that the ditch might be readily filled with water, the site chosen was usually either on the banks of a river, or on a peninsula running into a lake. In the latter case, the ditch was of course merely a deep cut made through the neck of land, by means of which the C. and its surroundings were converted into an island. On the inner side of the ditch, mounds were constructed, which were surmounted with walls and towers, both of which, but particularly the latter, were supplied with battlements and bastions. The entrance-gates were also protected by towers, which were usually of great strength. The communication was by a bridge, sometimes of stone, but usually of wood, which was made to draw up and down; and the entrance, in addition to thick folding-doors, was protected by a portcullis (q.v.), which was dropped down through grooves in the masonry at the sides. The gateway, in castles of the larger sort, was further defended by a barbican (q.v.). On passing the external wall, you entered the bailey (q.v.), which sometimes consisted of several courts, and contained the barracks, magazines, well, a chapel, and sometimes even a monastery. The only portion of the C. which was always spoken of as distinguished from the bailey, was the keep (q.v.) or citadel, which corresponded to the prætorium of the Roman fortification. The keep was a species of internal C., more strongly defended than any other portion of the fortress, and placed in the most advantageous position, so as to afford a last chance to the garrison when driven from the external works. As the keep had the same design as the C. itself, it contained most of its appliances, even to a chapel, when large and complete. The keep was also called the dungeon or donjon (q.v.). An excellent example of a keep is seen at Rochester castle. The best known is probably that at Windsor, which forms so prominent an object in the surrounding landscape. The protection which the walls of his C. afforded to the retainers of a baron in a state of society in which life and property were extremely insecure, naturally led to the construction of houses around the moat, and to this custom a very large number of the towns, both in England and on the continent of Europe, owe their origin. Along the banks of the Rhine, this process of town-formation may be seen in all its earlier stages; from the few peasants' houses and the village church nestling under the ivy-covered ruin on the cliff, to the large and prosperous city of Coblenz. Strange as it may seem, the existence of these castles may be regarded not only as a cause, but as an effect of a certain feeling of security on the part of the surrounding population; for where a country was thoroughly insecure, the risk of the castles falling into the hands of the enemy, and thus proving a source not of protection but of oppression, was so great as to prevent their erection. It is on this ground that sir Walter Scott explains the slight character of the fortresses on the Scottish border, notwithstanding centuries of warfare. "It was early discovered that the English surpassed their neighbors in the arts of assaulting and defending fortified places. The policy of the Scotch, therefore, deterred them from erecting upon the borders buildings of such extent and strength, as being once taken by the foe, would have been capable of receiving a permanent garrison. To themselves, the woods and hills of their country were pointed out by the great Bruce as their safest bulwarks; and the maxim of the Douglases, that 'it was better to hear the lark sing than the mouse cheep,' was adopted by every border chief." For these reasons, "we do not find, on the Scottish borders, the splendid and extensive castles which graced and defended the opposite frontier. The Gothic grandeur of Alnwick, of Raby, and of Naworth, marks the wealthier and more secure state of the English nobles." The residence of the Scottish chieftain, "was commonly a large square battlemented tower, called a *keep* or *peel*, placed on a precipice, or on the banks of a torrent, and, if the ground would permit, surrounded by a moat. In short, the sit-

uation of a border-house, encompassed by woods, and rendered almost inaccessible by torrents, by rocks and morasses, sufficiently indicated the pursuits and apprehensions of its inhabitants."—*Minstrelsy of the Sottish Border,* Introduction.

CASTLEBAR', the capital of the co. of Mayo, Ireland, 159 m. w.n.w. of Dublin. It is situated on the Castlebar river, near the head of a valley at the n.w. end of the great limestone plain which includes the greater part of the counties of Roscommon, Sligo, Galway, and Mayo. The two main streets cross each other, and the chief buildings are in a square near the w. end. The suburbs, as in most of the w. Irish towns, consist of the wretched hovels of agricultural laborers. Pop. '81, 3,855. C. has some coarse linen manufactures. Here the Irish, in the rebellion of 1641, massacred the English parliamentary army, and in 1786 was executed the famous "fighting Fitzgerald." In 1798, the French gen. Humbert, held the town for a fortnight. In 1846 and 1847, C. suffered extremely from the famine.

CASTLEMAINE, a t. in the province of Victoria, Australia, 65 m. n.w. of Melbourne; pop. '71, 7,308. It was a place of much importance when gold mining began, the diggings near by being among the earliest opened. The Victoria railroad passes through the town.

CASTLE PEAK, a peak of the Sierra Nevada in California, about 38° 10′ n.; height estimated at 13,000 feet.

CASTLEREAGH', Lord. See Londonderry, Marquis of.

CASTLES, in heraldry, are often given as charges in the shields of persons who have reduced them, or been the first to mount their walls in an assault. The practice of heralds, in this as in other respects, has not been very consistent, as we learn that in 1602, a castle was granted by William Cambden, Clarencieux king of arms, to William Frear, doctor of physic!

CASTLETON, a t. in Richmond co., New York, forming the n. portion of Staten island, and occupied in part by the summer residences of business men of the city, pop. '75, 10,957; in '80, 12,679. New Brighton is the only considerable village. There are ferries from several points in the township to New York, and one to New Jersey; and a railroad connects with the southern part of the island. Among the institutions is "Sailor's Snug Harbor," a home for old and indigent seamen, established about the beginning of the century by capt. Randall. The surface of the township is hilly, and there are many charming sites occupied by handsome modern villas, from some of which wide views may be had over the city of New York, and large portions of New Jersey, Long Island, and the ocean.

CASTLETON, a village in Rutland co., Vt., 12 m. s. of Rutland, reached by the Rensselaer and Saratoga, and the Rutland and Washington railroads; pop. '80, 2605. The slate quarries in the neighborhood are valuable. In the village is the state normal school.

CASTLETOWN, the capital town and seat of government of the Isle of Man, called in Manx *Balley Cashtal,* or the Town of the Castle. C. is situated on the margin of Castletown bay, near the southern extremity of the island, and surrounds Castle Rushen, a Danish fortress of prodigious strength, having walls from 12 to 18 ft. in thickness, built of the limestone found on the spot, which is of so imperishable a nature that the sharp angles of the keep retain the marks of the builder's chisel, though completed in the 10th century. The castle was founded by Guthred II. of the Orrys kings of Man, and having been added to from time to time, it now consists of a pile of building of a most imposing appearance. It underwent a six months' siege by Robert Bruce in 1313. The keep is used as the public jail of the island, and the other portion of the castle consists of public offices, officer's apartments, and accommodation for the chancery and other superior courts.

Being in the neighborhood of the bold coast-scenery of the Calf of Man, Spanish head, etc., C. is a desirable resort for the numerous tourists who frequent the Isle of Man. Ship-building has of late made considerable progress in Castletown. Pop. '71, 2,320.

CASTOR, Antonius, an eminent botanist of Rome in the first century after Christ; several times quoted and mentioned by Pliny. He had a botanical garden, probably the earliest on record. He lived more than 100 years in perfect health, it is reported, both of body and mind.

CASTORËUM, a substance secreted in two glandular sacs, closely connected with, but quite distinct from, the organs of reproduction in the beaver (q.v.), and at one time held in the highest repute in medicine, although now regarded as almost inert, and chiefly used by perfumers. The C. sacs are pear-shaped, and it appears in commerce in these sacs themselves, connected in pairs as they are taken from the animal. C. is produced both by the male and by the female beaver. In Hudson's bay commerce, ten pair of them are equal in value to one beaver skin. Russian C. is of much higher value than American. C. was well known to the ancients. From the time of Hippocrates, it was regarded as having a specific influence over the uterus, and is still in use in the

n. of Europe. It was at one time also esteemed a most valuable medicine in hysteria, catalepsy, and other spasmodic diseases.

CASTORIDÆ, a family of *mammalia*, of the order *rodentia*, of which the beaver (*castor*) is the type, and in which, besides the beaver, the coypu (*myopotamus*), and the *musquash*, some naturalists include other genera more commonly regarded as belonging to the mouse and rat family (*muridæ*), as the lemmings and voles.

CASTOR OIL, a fixed oil obtained from the seeds of the C. O. plant. In extracting the oil, the seeds are first bruised between heavy rollers, and then pressed in hempen bags under a hydraulic or screw press. The best variety of oil is thus obtained by pressure in the cold, and is known as *cold-drawn* C. O.; but if the bruised and pressed seeds be afterwards steamed or heated, and again pressed, a second quality of oil is obtained, which is apt to become partially solid or frozen in cold weather. In either case the crude oil is heated with water to 212°, which coagulates, and separates the albumen and other impurities. Exposure to the sun's light bleaches the oil, and this process is resorted to on the large scale. When pure and cold-drawn, C. O. is of a light yellow color; but when of an inferior quality, it has a greenish, and occasionally a brownish tinge. It is somewhat thick and viscid. Its specific gravity is high for an oil, being about 960 (water being taken as 1000). It is miscible with alcohol or spirits of wine and ether. Reduced to a temperature of 0° F., it does not become solid; but exposed to the air, it very slowly becomes rancid, then dry and hard, and serves as a connecting link between the drying and non-drying oils. It has a nauseous smell, and an acrid, disagreeable, and sickening taste, which may be overcome by the addition of a little magnesia. The principal acid present in it is *ricinolic* acid ($HO, C_{36}H_{33}O_5$), which is allied to oleic acid.

C. O. is one of the most convenient and mildest of purgative medicines. Given in doses of one or two tea-spoonfuls, with a little peppermint-water, it forms a gentle laxative for habits easily acted on by medicine; while a dose of a table-spoonful, or a little more, will almost always succeed if it remains on the stomach. The only serious objections to the use of C. O., are its disagreeable flavor, and the sickness often produced by it; some persons get over this difficulty by floating the oil in hot coffee, which is said to remove its nauseous quality.

The adulteration of C. O. may be various. Several of the fixed oils, including lard, may be employed. The best test of its purity is its complete solubility in its own volume of absolute alcohol, which other fixed oils are not. Croton oil is occasionally added to increase the purgative powers of the oil.

The CASTOR OIL PLANT (*ricinus communis*) is a native of the s. of Asia, but now naturalized in the s. of Europe, and in other warm regions of the globe. The genus *ricinus* belongs to the natural order *euphorbiaceæ*. It has panicled flowers, with 3 to 5-partite perianth; the fruit a tricoccous capsule, with one seed in each cell, the outside of the capsule generally covered with soft spines. The C. O. plant is often cultivated in gardens in the middle and even in the northern parts of Europe, where it is only an annual, attaining a height of 3 to 10 feet, but highly ornamented by its stately growth, its large, broad, palmato-peltate, 7 to 9-fid leaves, ¾ to 2 ft. in diameter, and its generally purplish hue. Its flowers are produced in long glaucous racemes. In warmer climates, it is perennial, and its stem becomes arborescent, attaining even 30 ft. in height, with a corresponding thickness, so that ladders are used for climbing it. Different species which have been described, are probably mere varieties. It was known to the ancients, and appears to have been valued by them. Its seeds have been found in Egyptian sarcophagi. From the resemblance of its seeds to an insect called *ricinus*, it received that name from the Romans. The seeds are oval, and about four lines long. They are chiefly valued for the oil which they yield, on account of which the plant is cultivated in the Levant, Spain, Provence, the West Indies, Brazil, the United States of America, as far n. as New Jersey, and in other tropical and warm temperate countries.—Although C. O. is chiefly used in medicine, it is not unfit for lamps and for oiling the wheels of machinery. The streets of Lima are lighted and the machines used in the works of the sugar plantations of Peru are oiled with it. The appearance of the C. O. plant obtained for it the name of *palma christi*, by which it is still sometimes called. Its seeds were formerly known as *semina cataputiæ majoris*.

CASTOR AND POLLUX, twin gods of Greece and Rome; known under the name of Dioscuri (from Dios or Jupiter, and Kouroi, children); children of Jupiter by Leda, who met the divinity in his form of a swan. The Dioscuri were specially reverenced among people of the Dorian race, and were said to have reigned at Sparta. They presided over public games, Castor being the god of equestrian exercises, and Pollux the god of boxing; but both were usually represented on fiery steeds, with spears, and egg-shaped helmets crowned with stars. They were the patrons of hospitality, and their aid was especially sought by travelers, to whom they were always gracious. Among their exploits were the invasion of Attica to rescue their sister Helen from Theseus; their part in the Calydonian hunt; their participation in the Argonautic expedition, during which they married the daughters of Leucippus; and lastly their battle with the sons of Aphareus, in which Castor (the mortal brother) was slain by Idas. On finding him dead, Pollux, who was immortal, implored Jupiter to permit him also to die; but

Homer says the dead one was permitted to live again on condition that both should, on alternate days, descend to Hades, or that they should live only on alternate days. Another story is that they were placed among the stars, and now, as the Twins, form one of the 12 zodiacal signs. They were greatly venerated at Rome, where it was believed that at the battle of lake Regillus they fought at the head of the legions of the commonwealth, and afterwards with incredible speed carried to the city the news of the victory. Where they alighted near a well in the forum, a temple was built, and a great festival was held in their honor during the ides of Quintilis, the supposed anniversary of the battle, where sacrifices were offered at the public charge. A part of the ceremonies was a grand muster of the equestrian body, when all the knights, clad in purple and crowned with olive, assembled at the temple of Mars, out of the city, and rode in state to the forum where stood the temple of the twins. For centuries this pageant was one of the most splendid sights in Rome. In the days of Dionysius the cavalcade consisted of 5,000 horsemen, all persons of wealth and honorable repute.

CASTOR AND **POLLUX,** the two principal stars in the constellation Gemini (q.v.), were so called from Castor and Pollux, sons of Leda and Tyndareus, king of Lacedemon. Their sister was the famous Helen of Troy. On account of their mutual attachment, Zeus placed them among the stars.

CASTOR AND **POLLUX,** the name given to a meteor, seen at sea, and which, under the form of twin balls of fire, attaches itself to the masts of ships. Sailors predict fair weather from its appearance. Sometimes, however, only one ball of fire is seen; the meteor is then called Helena, and it is regarded as foreboding a storm. Shakespeare makes mention of this superstition in the *Tempest* (act i. scene 2).

CASTRAMETATION is the art of encamping; and a *camp* is the result of that art. See CAMP, ENCAMPMENT.

CASTRA'TION, taking away. or destroying the natural powers, or the essential organs of generation in animals; in males the removal of the testicles, and in females a mutilation or removal of the ovaries, commonly called "spaying." The general purpose is to make domestic animals more docile and useful, and more valuable for meat, as well as to restrict unlimited reproduction.

CASTREN, MATTHIAS ALEXANDER, the greatest authority in regard to the Finnish people and language, was b. in 1813, not far from the Lappish boundaries of Finland. He received his earliest instruction in the town of Tornea, and afterwards studied at Helsingfors. About the year 1838, he undertook a pedestrian excursion through Finnish Lapland, in order to extend his knowledge of the language and literature; and, in 1840, another through Carelia, to collect ballads, legends, etc., illustrative of Finnish mythology. On his return, he published in Swedish a translation of the famous Finnish poem, *Kalevala*, the meter and style of which have been imitated by Longfellow in his poem of *Hiawatha*. Aided by the government of his native province, he commenced his researches among the Finnish, Norwegian, and Russian Laplanders, as also among the European and Siberian Samoyeds. Appointed linguist and ethnographer to the St. Petersburg academy, C., between the years 1845 and 1849, prosecuted his laborious investigations as far e. as China, and as far n. as the Arctic ocean. On his return, he was appointed first professor of the Finnish language and literature at the university of Helsingfors. He employed himself in preparing for publication the vast materials which he had collected, but died 7th May, 1852, from exhaustion—a martyr to science. Before his death, appeared *Versuch einer ostjäkischen Sprachlehre nebst kurzen Wörterverzeichniss* (Petersburg, 1849), as the first installment of his *Northern Travels and Researches*. He also wrote *Elementa Grammaticæ Syrjaenæ* (Helsingfors, 1844), and *Elementa Grammaticæ Tscheremissæ* (1845); *On the Influence of the Accent in the Lappish Language* (Petersburg, 1845); *De Affixis Personalibus Linguarum Altaicarum* (Helsingfors, 1850), etc.

CASTRÉN', MATTHIAS ALEXANDER, 1813–52; a native of Finland, and the first eminent philologist and antiquarian of that country. He traveled extensively in all parts of the country to become familiar with the language (having been educated in Swedish), and with the antiquities and folk-lore of the people. He also traveled among the Samoieds of Europe and Siberia to the provinces of China and the Arctic ocean. He was the first professor of the Finnish language and literature at the university of Helsingfors. All his works were published after his death, and a monument has been dedicated to his memory at Helsingfors.

CASTRES, a t. of France, in the department of Tarn, is situated on both sides of the river Agout, 46 m. e. of Toulouse. The two parts of the town are united by two stone bridges. In the middle ages, C. was celebrated for its Benedictine abbey, the heads of which exercised a temporal sway over the place. Later, it was one of the strongholds of the reformed party, but it was forced to submit, and had its fortifications demolished in the reign of Louis XIII. C. has beautiful promenades, shaded by fine alleys of trees, and in the neighborhood is a remarkable rocking-stone, 11 ft. high, and weighing some 30 tons. It is of egg-shape, and rests upon its smaller end; a strong push is sufficient to cause its vibration. C. is a busy manufacturing place. Its fine wool-dyed goods are

especially famous, and it has also manufactures of linen, leather, paper, soap, etc. Pop. '76, 20,520.

CASTRI, or KASTRI, a village of modern Greece, in the government of Phocis, situated on the s. declivity of Mt. Parnassus, and worthy of notice, as occupying a portion of the site of the ancient Delphi (q.v.). The famous Castalian spring, now called the fountain of St. John, is situated between 200 and 300 yards to the e. of the village. Beside it grows a plane-tree, the only one in C., which is fabled to be that planted by Agamemnon.

CASTRO (ancient *Mitylene*), a seaport t. of Asiatic Turkey, capital of the island of Mitylene, situated on the e. coast, about 55 m. n.w. of Smyrna. It is surrounded with walls, and defended by a castle, and its streets are narrow and dirty. Remains of the ancient town are found to the west. Pop. 6,500.

CASTRO : co. Tex. See page 890.

CASTRO, GUILLEN DE, 1569–1631; a Spanish dramatist who enjoyed the friendship of Lope de Vega, whom he assisted in the famous festival of the canonization of San Isidoro, where he won a prize in the literary tournament. Castro wrote about 40 plays, the most celebrated of which was *Las Mercedes del Cid*, to which Corneille was greatly indebted for the materials of his renowned tragedy. It is said that Castro died in poverty and was buried by charitable friends.

CASTRO, HENRY, 1786–1861; a native of France, an officer of the national guard of Paris, who, after the downfall of Napoleon, emigrated to the United States, and in 1827, was consul for Naples at Providence, R. I. He returned to Paris 11 years later, became a partner in the counting-house of Lafitte, and was made consul-general for the new republic of Texas. He engaged in the business of sending out emigrants, and within a few years established at Castroville and other places settlements which, after the annexation, were organized into Medina county.

CASTRO, INEZ DE, whose mournful fate is the subject of several tragedies and poems, was the daughter of Pedro Fernandez de Castro, and sprang from a branch of the royal family of Castile. She was appointed lady-in-waiting to the wife of Dom Pedro, son of Alfonso IV. of Portugal. Her beauty captivated Dom Pedro, and, after the death of his wife, in 1345, he secretly married Inez. Their stolen interviews took place in the convent of St. Clara, at Coimbra, until the secret was discovered and revealed to the king, who was made to believe that this union might prove injurious to the young Ferdinand, son of Dom Pedro by his deceased wife. Questioned by his father, Dom Pedro had not the courage to reveal the whole truth, while he refused to marry another. In the king's council, it was determined that Inez must die. To see this sentence executed, the king hastened to Coimbra, while his son, Dom Pedro, was engaged in hunting (1355); but the sight of the beautiful Inez, who, with her children, cast herself at the feet of the king, and prayed for mercy, diverted him for a few moments from his purpose. His advisers, however, soon obtained from the king permission to execute the sentence, and, in the course of an hour after the interview, Inez fell pierced by the daggers of assassins. Dom Pedro attempted a revolt against his father, but was pacified by the queen and the archbishop of Braga, and promised not to seek revenge for the death of Inez. Two years afterwards, the king died, having shortly before his death recommended the murderers of Inez to leave Portugal, and seek shelter in Castile, where Peter the cruel was then ruling. As several of Peter's nobles had escaped into Portugal, to avoid his oppression, he now proposed to Dom Pedro an exchange of fugitives, to which the latter (now king of Portugal) consented. Two of the assassins accordingly were delivered up, and were tortured and burned. Two years afterwards, the king, in an assembly of the nobility, declared that he had been lawfully married, by papal sanction, and in the presence of the archbishop of Guarda, to Inez de Castro. When this statement had been confirmed by several testimonies, the king gave orders that the corpse of Inez should be removed from its grave, clothed in royal attire, with a crown on the head, and seated on a throne, should receive homage as queen. This strange ceremony was performed, the nobles of Portugal bowing before the enthroned dead, and kissing the hem of the royal robe. The body was then removed to Alcobaça followed by the king, with the bishops and the nobility, all on foot. A splendid marble monument was erected over the grave of Inez, surmounted by her statue, wearing a crown.

CASTRO, JOÃO DE, 1500–48; viceroy of the Portuguese Indies, son of the civil governor of Lisbon. He served in a military capacity in Tangier, Tunis, and elsewhere, and went to the Indies with his uncle, Garcia de Noronha. On arriving at Goa he enlisted among the "bravest of the brave" who were told off for the relief of Diu (a Portuguese settlement on an island of the same name, in the present province of Guzerat). Returning to Portugal he was made commander of a fleet to clear the European seas of pirates; and in 1545 he was sent out as viceroy of the Indies to supplant Martin de Souza. The next three years were full of struggle, suffering, and triumph. Valiantly seconded by his two sons, one of whom was killed before Diu, he overthrew Mahmoud, king of Cambodia, relieved the beleaguered town of Diu, and defeated the great army of Adhel Khan. He subsequently completed the subjugation of Malacca, soon after which he was fully commissioned as viceroy, but did not live long to fill the place, dying the next year in the arms of his friend, St. Francis Xavier. He was buried at Goa, but the body was after-

wards removed to Portugal, to be interred under a splendid monument in the convent at Bemfica.

CASTRO DEL RIO, a t. of Andalusia, Spain, situated on a slope on the right bank of the Guadajocillo, 16 m. s.e. of Cordova. A portion of the old town is surrounded by ruinous walls; the new town lying outside of these has some good streets. It has manufactures of woolen and linen fabrics, earthenware, etc., and considerable trade in agricultural produce. Pop. 9,100.

CASTRO-GIOVANNI, a t. of Sicily, in the province of Caltanisetta, is situated 13 m. n.e. of the chief town of the province, on a remarkably fertile plateau, which rises precipitously to a height of 4,000 ft. above the sea-level. Castro-Giovanni occupies the site of the ancient *Enna*, of which Ceres was the presiding goddess, and her most famous temple was here. The neighborhood was the scene of Proserpine's abduction by Pluto. In connection with the Punic and Servile wars, Enna has a conspicuous part in early history. There are no remains of the old town. A castle and other buildings of Saracenic origin are still standing. The district yields large quantities of sulphur. Pop. 14,633.

CASTRONUOVO, a t. of Sicily, in the province of Palermo, 25 m. n. of Girgenti. It is situated on a hill, is fortified, and in its vicinity are quarries of fine marble. Pop. 4,029.

CASTROVILLA'RI, a t. of s. Italy, in the presence of Cosenza, 34 m. n. of Cosenza. It is situated on an eminence surrounded by mountains, is partially fortified, and has an old massive castle, and a trade in wine, manna, silk, etc. Pop. 7,931.

CASTRUC'CIO CASTRACA'NI, 1283–1328; a Ghibelline exiled at an early age with his parents and others of that faction; orphaned at the age of 19; served as a soldier in England, France, and Lombardy, until in 1313 he returned to Italy and was chosen chief of the Ghibellines, who had obtained mastery over the Guelphs. Thenceforth he passed a stormy life, chiefly in the support of the emperor Louis V., whom he accompanied to Rome, and who made him duke of Lucca, count of the Lateran palace, and senator of the empire. Castruccio was excommunicated by a Guelphic legate, and died soon afterwards, leaving several children, whose fortunes were wrecked in the Guelphic triumph that followed his death.

CAST-STEEL. This term, until lately, was confined to steel made by melting blister-steel (q.v.), obtained by the old cementation process. Through this simple operation of melting it in crucibles, which was invented by an Englishman named Huntsman about the middle of last century, steel was first readily made perfectly homogeneous, and fitted for the production of the finer kinds of tools and cutting instruments. The crucibles are made of fire-clay, mixed with a small proportion of the material of old ones and coke. They are very carefully prepared and annealed, but notwithstanding this, the heat of the furnace is so high that they can only be three times used. Each crucible contains from 30 to 40 lbs. of steel, which is poured, when melted, into cast-iron ingot-molds previously smoked. The name "cast-steel," however, can no longer be confined to steel so made, because Bessemer steel, although produced by a quite different process, is truly a cast-steel. In Sheffield, the finer kinds of cast-steel are now sometimes called "crucible steel;" but since puddled steel, which, like the Bessemer, cannot be used for fine cutlery, is also cast in crucibles, such a term is not sufficiently distinctive.

CASTUE'RA, a t. of Estremadura, Spain, 68 m. e.s.e. of Badajos. It is situated near the right bank of the Guadalefra, has several good streets, manufactures of brick, earthenware, etc., and a trade in agricultural produce; there is also some weaving carried on. Pop. 5,600.

CASUAL POOR are persons temporarily relieved without being admitted to the roll of permanent paupers. See POOR-LAWS.

CASUALTIES OF SUPERIORITY, in the feudal law of Scotland, are such emoluments arising as to the superior as depend on uncertain events. See WARD-HOLDING.

CASUARI'NA, a genus of trees of the natural order *amentaceæ*, and of the sub-order *casuarineæ*, which is regarded by some as a distinct natural order. The trees of this genus are almost exclusively Australian; one only, *C. equisetifolia*, being found in the South Sea islands, the Indian archipelago, the Malayan peninsula, and on the e. side of the bay of Bengal, as far n. as Arracan. Some of them are large trees, producing timber of excellent quality, hard and heavy, the *beef-wood* of the Australian colonists, so called from the resemblance in color to raw beef. *C. equisetifolia* is called in Australia the SWAMP OAK. It is a lofty tree, the *toa* or *aitoa* of the Society islands, where it grows chiefly on the sides of hills, and where its wood was formerly used for clubs and other implements of war. It has been introduced into India, and is there much valued, as its wood bears a great strain, and is not readily injured by submersion in water. The hardness and durability of this wood led the earlier voyagers to the South Sea islands to designate it *iron wood*. *C. quadrivalvis* is the SHE OAK of New South Wales. CASSOWARY TREE is a popular generic name of the *casuarinæ*. Some of the species are scrubby bushes. All of them have a very peculiar appearance, their branches being long, slender, wiry, drooping, green, jointed, with very small scale-like sheaths instead

of leaves. They resemble arborescent *equisetaceæ*. The fruit consists of hardened bracts, collected in a *strobilus*, or cone, and inclosing small winged nuts. The flowers have neither calyx nor corolla; the stamens and pistils are in separate flowers, the male flowers with only one stamen, the female flowers with a one-celled ovary, the male flowers in spikes, the female flowers in dense heads. More than 20 species are known.

CASUISTRY, called by Kant the *dialectics of conscience*, is that branch of theology and morals which professes to deal with very delicate moral questions—*casus conscientiæ*—and which supplies rules and principles of reasoning for resolving the same; drawn partly from natural reason and equity, and partly from the authority of Scripture, the canon law, councils, fathers, etc. C. has been, and still is, studied chiefly by Roman Catholic theologians; but at one period Protestant divines also paid some attention to the perilous science. The rudiments of it, however, are to be sought for in antiquity. Traces of it are found in the Stoic philosophers of ancient Greece. This is not to be wondered at, for C. is not, in its essence, a device of the schoolmen, although the latter elaborated it into a science, but a natural expression of the intellect and moral nature of man, when he is placed in circumstances of great perplexity. The sound and healthy reason of antiquity, however, could not enter into the morbid refinement, or rather the insidious corruption of morals found in certain Jewish and Christian writers. The *Talmud* (q.v.) contains an enormous accumulation of casuistical questions, while the sphere of Christian ethics in the middle ages often became a mere arena for unprofitable and pernicious disputations of this nature, as is seen in such works as the *Summa Raymundiana, Summa Astesana, Summa Bartholina,* which obtained their names from their respective compilers. At a later period, the Jesuits Molina, Escobar, Sanchez, Busenbaum, etc., became notorious for their abuse of ingenuity in the construction of moral puzzles, and for the flagrant immorality of their solutions. Some of them still "suffer the vengeance" of Pascal's immortal satire. It is nevertheless indubitable, that in the life of every man—now as formerly—*casus conscientiæ* will at times arise, when the higher laws of morality come into collision with subordinate conventional ones. The dubiety as to what the path of duty is, what *ought* to be done, resulting from this collision, naturally and legitimately leads to many nice considerations. If these are carried on under the guidance of a pure conscience, no harm can ensue, but, on the contrary, much good. Such, however, is not the *perverted* C. of the Jesuits, "the art of quibbling with God," as M. Le Feore, preceptor to Louis XIII., called it, in which a man seeks to justify, by subtle quirks, his immoral actions. Mayer has published an account of all the writers on cases of conscience, ranging them under three heads—Lutheran, Calvinistic, and Romish.

CA'SUS BEL'LI, or a case of war, is the reason alleged by one power for going to war with another. It is found impossible to reduce these causes or reasons to any definite code, because an ambitious or aggressive power has no difficulty in *making* a reason to declare to others, without acknowledging the real reason.

CASWALL, HENRY, D.D., 1810–70; b. in England, and emigrated to the United States at the age of 18, graduating at Kenyon college, Ohio. After some years of service as minister and professor of theology, in 1842 he returned to England, and procured a private act of parliament recognizing the validity of his ordination in the United States. He was appointed vicar, became proctor, and prebendary of Salisbury cathedral. About 1868, he returned to the United States, and he died in Pennsylvania. He wrote *America and the American Church; Scotland and the Scottish Church; The Western World Revisited; The Martyr of the Pongas;* and two works on Mormonism.

CASWELL, a co. in n. North Carolina, on the Virginia border, watered by the tributaries of the river Dan, and intersected by the Richmond, Danville and Piedmont railroad; 400 sq.m.; pop.'80, 17,825—10,657 colored. The chief productions are tobacco, corn, oats, and wheat. Co. seat, Yanceyville.

CASWELL, ALEXIS, D.D., LL.D., 1799–1877; one of the corporators of the national academy of sciences. He was professor of mathematics in Brown university from 1828 to 1850, and of mathematics and astronomy from 1850 to 1864, and president from 1868 to 1872. Author of a *Memorial of John Barstow.*

CASWELL, RICHARD, 1729–89; a revolutionary officer, native of Maryland, but an early settler in North Carolina, where he was for many years a member of the colonial assembly, speaker of the house, treasurer of the state, first governor, and thrice re-elected. He was a delegate to the convention that framed the federal constitution, and in 1787, was speaker of the state senate, and was presiding in that body when he was stricken with fatal paralysis. He was a brig.gen. in the patriot armies, and shared in the battle of Camden, and other conflicts.

CAT (Lat. *catus*), a name sometimes extended to the whole family of quadrupeds designated by zoologists *felidæ* (q.v.), the genus *felis* of Linnæus; and sometimes more restrictedly applied to a section of that family, containing a number of its smallest species, the domestic C. and species most nearly allied to it. These form the subject of the present article. They all pursue their prey on the branches of trees more than on

the ground, and are most expert climbers, in which, however, they are rivaled by some of the other *felidæ*.

The origin of the domestic C. is by no means well ascertained; and by some naturalists it is described as a distinct species, under the name *felis domestica*, which perhaps may be regarded as at least a convenient provisional designation, until satisfactory reasons can be adduced for referring it to some species existing in a wild state. By many, indeed, the domestic C. has been confidently pronounced to be a mere domesticated variety of the common wild C. (*felis catus*) of Europe and the n. of Asia; but to this there are many objections; the most important being that it is always of smaller size, contrary to what is usually observed of the effects of domestication in animals; and that in cats of the domesticated race which have run wild, and in their known progeny, there is no appearance whatever of a tendency to return to the type of the true wild cat.—Another opinion as to the origin of the domestic C. has obtained the assent of a considerable number of naturalists; that it is derived from the *felis maniculata*, or gloved C. of n. Africa, a species discovered by the celebrated traveler Rüppell. But Mr. Owen has stated a perfectly conclusive reason against identifying the domestic C. with the *felis maniculata*, that the first deciduous molar tooth in the latter has a relatively thicker crown, and is supported by three roots, whilst the corresponding tooth both of the domestic C. and of the wild C. of Europe has a thinner crown, and only two roots.

The certainty, however that the C. existed as a domestic animal in ancient Egypt, makes it not improbable that we ought to look for its origin on the banks of the Nile, or in some of the countries from which the ancient Egyptians might most readily have obtained it. Of its rarity in Britain in former times, when the wild C. was common in all the woods which covered so much of the island, a curious evidence is afforded by a Welsh law quoted by Pennant—a law of the reign of Howel the good, who died in 938 A.D.—fixing the prices of cats according to their age and qualities, beginning with a price for a kitten before it could see, and enacting that if any one stole or killed the C. that guarded the prince's granary, he was to forfeit a milk ewe, its fleece and lamb; or as much wheat as when poured on the C. suspended by its tail, the head touching the floor, would form a heap high enough to cover the tip of the tail.

It is needless to describe an animal so well known as the domestic C., or to do more than allude to its purring, its mewing, and the other sounds which it makes, its aversion to wet its feet or fur, its love of heat and comfort, its stealthy manners when in quest of prey, its patient watchfulness, so often fatal to mice, and other points of its natural history with which everybody is familiar.

The delight which a C. takes in tormenting a mouse before killing it, has sometimes been mentioned as an apparent exception to the general character of goodness manifest in the instincts of animals. It is an interesting circumstance, however, that when the prey is a bird instead of a mouse, a C. immediately inflicts a mortal wound as if aware of its greater power of effecting its escape.

The eye of the C. is capable of much contraction and dilatation of its pupil, so that the animal can see in a very feeble light, and is thus adapted for those nocturnal habits to which, even in domestication, it shows so strong a natural tendency.

The fur of the C. is very free from any oily substance, so as to be readily injured by water, and is capable of being rendered highly electric by friction, particularly in very dry or frosty weather. An electric spark is readily obtained from the tip of the ear.

The strong statements of Buffon gave for a time great currency to the opinion, that the C. is incapable of affection, and retains, even in a domesticated state, its savage ferocity, merely restrained by selfishness, and disguised by cunning. The belief is very prevalent that the C. forms an attachment to places only, and not to persons There are, however, well-authenticated stories which prove the C. to be capable of strong attachment to its master or mistress, although this quality is less frequently and remarkably displayed than by the dog. The instances which have, on the other hand, been recorded to show the attachment of the C. to places, are well worthy of attention in connection with the subject of instinct in animals. Some of these instances of cast finding their way back from great distances to their former home, are very wonderful, and indeed cannot be explained on any grounds or principles known. The same instinct and power, however, are displayed by other animals.

The varieties of the domestic C. are neither numerous nor very different. The *tortoise-shell C.* differs from the most common variety chiefly in color, although it is also particularly elegant and delicate in form. It is much more common in the s. of Europe than in Britain.—The *Angora C.* is a beautiful variety, remarkable for its long silky hair.—The *Chinese C.* has a fine glossy fur, and is remarkable for its pendulous ears.—The *Chartreuse* is of a bluish color.—It is supposed that the *tabby* may have undergone less change by domestication than any other variety.

The wild C. is still to be found in a few of the woods of the n. of England, in the mountains of Wales, the Highlands of Scotland, and some parts of Ireland. It has entirely disappeared from districts where it was once common. It is the only beast of prey remaining in Britain the strength and fierceness of which make it at all dangerous to man; but an encounter with a wild C. is safe only to a man well armed. Fortunately, the instances of its attacking when unmolested are rare, but such instances have occurred. The wild C. is an inhabitant of deep thickets and recesses of woods, and of the rocky and

bushy ravines of mountainous districts. Its fur is held in considerable estimation. The fur is soft, long, and thick. The color of the face is yellowish-gray, with a band of black spots towards the muzzle; the forehead is brown; the head is gray, with two black stripes passing from the eyes, over and behind the ears; the back, sides, and limbs are gray, darker on the back, paler on the sides, with a blackish longitudinal stripe along the middle of the back, and numerous paler curved ones on the sides; the tail is ringed with light-gray and black, the tip being black. The length of a medium-sized male wild C. is almost 2 ft., exclusive of the tail, but this length is sometimes very considerably exceeded.—We know no record of any attempt to domesticate the wild cat.

The animal often called wild C. in America is the bay lynx. See Lynx.

Superstitions regarding Cats.—Cats have been objects of superstition from the earliest ages. In Egypt, they were held in the highest reverence; temples were erected in their honor; sacrifices and devotions were offered up to them; and it was customary for the family in whose house a C. died to shave their eyebrows. In the middle ages, they were regarded as the familiars of witches. The favorite shape of Satan was said to be that of a black C.; and the animal was an object of dread instead of veneration. There is or was a belief among sailors, that the frolics of a C. at sea portended a storm. Many people still prophesy rainy weather from a C. washing its face; and a cat-call on the house-top was formerly held to signify death. Their superstitious connection with witches, and the foolish belief that a C. has nine lives, have led to the perpetration of great cruelties upon this harmless and very useful domestic animal. See Brand's *Popular Antiquities*, Ellis's revised edition.

CAT, on shipboard, is a name for many of the ropes or lines employed. A *cat-fall* is a rope for heaving up the anchor from the water's level to the bow; it works through *cat-blocks*, and is connected with the *cat-head*. *Cat-harpings* are small ropes for tightening the shrouds. The *cat-heads*, just named, are two strong short timbers projecting from the bow, on each side of the bowsprit. A *cat-hook* fastens the ring of the anchor to the cat-block.

CAT, or Cat-Castle, in the military engineering of the middle ages, was a kind of movable tower to cover the sappers as they advanced to a besieged place. The garrison sometimes poured down burning pitch and boiling oil from the walls upon the C.; but occasionally this stratagem was disastrous, for the besiegers availed themselves of the blazing tower to burn the wooden gates of the town or fortress.

CATABRO'SA (Gr. *catabrōsis*, a gnawing), a genus of grasses formerly included in *aira* (see Hair-grass), but distinguished by the leathery *paleæ*, which are ribbed, truncated, erose (as if gnawed at the points), awnless, and nearly equal. The glumes are much shorter than the spikelets, membranaceous, and very obtuse. The general appearance is different from that of the genus *aira*.—*C. Aquatica* is a pretty common British grass. It is of very wide geographic and climatic range, being found throughout Europe, from Lapland to the Mediterranean, and also in the torrid regions of South America. It grows only in very moist situations, as the muddy margins of lakes and rivers, ditches, etc., and is only cultivated in irrigated meadows, or on the banks of rivers subject to be overflowed by high tides, where the ground is always wet and muddy. It is one of the most valuable grasses for such situations, its foliage being peculiarly sweet, and much relished by cattle. Both its foliage and its seeds, also, afford much food to water-fowl, and to some kinds of fish, particularly carp. Its leaves often float, and its stalks seldom rise more than a foot or 15 in. above the surface of the water. It has a stiff branching panicle, with whorled spreading branches, and its seeds are small. When its artificial propagation is attempted, it is more frequently by dropping freshly gathered stems into still waters, or scattering them on the mud, than by sowing the seeds. It is sometimes called Whorl Grass, and sometimes Sweet Water Grass.

CATACOMBS (Gr. *kata*, and *kumbos*, a hollow), subterraneous chambers and passages formed generally in a rock, which is soft and easily excavated, such as *tufa*. C. are to be found in almost every country in which such rocks exist, and, in most cases, probably originated in mere quarries, which afterwards came to be used either as places of sepulture for the dead or as hiding-places for the living. The most celebrated catacombs in existence, and those which are generally understood when C. are spoken of, are those on the Via Appia, at a short distance from Rome. To these dreary crypts it is believed that the early Christians were in the habit of retiring, in order to celebrate their new worship, in times of persecution, and in them were buried many of the saints and martyrs of the primitive church. They consist of long narrow galleries, usually about 8 ft. high and 5 wide, which twist and turn in all directions very much resembling mines; and at irregular intervals, expand into wide and lofty vaulted chambers. The graves were constructed by hollowing out a portion of the rock, at the side of the gallery, large enough to contain the body. The entrance was then built up with stones, on which usually the letters D. M. (Deo Maximo), or XP., the first two letters of the Greek name of Christ, were inscribed. Other inscriptions and marks, such as the cross, are also found. The original extent of the C. is uncertain, the guides maintaining that they have a length of 20 m., whereas about 6 only can now be ascertained to exist, and of these, many portions have either fallen in or become dangerous. When Rome was besieged by the Lombards in the 8th c., many of the C. were destroyed, and the

popes afterwards caused the remains of many of the saints and martyrs to be removed and buried in the churches. Art found its way into the C. at an early period, and many remains of frescoes are still found in them. After being neglected for centuries they were again brought to notice by father Bosio, who spent thirty years in their exploration. His investigations were published in 1632, two years after his death; but the most exhaustive treatise on the subject in all its aspects is the *Roma Sotterranea* of De' Rossi (1864–67), of which an abridgment is published in English by Dr. Northcote. The C. at Naples, cut into the Capo di Monte, resemble those at Rome, and evidently were used for the same purposes, being in many parts literally covered with Christian symbols. In one of the large vaulted chambers there are paintings, which have retained a freshness which is wonderful, considering the time and the dampness of the situation. The palm-tree, as a memorial of Judea, is a prominent object in these pictures. At Palermo and Syracuse there are similar C., the latter being of considerable extent. They are also found in Greece, in Asia Minor, in Syria, Persia, and Egypt. See NECROPOLIS. At Milo, one of the Cyclades, there is a hill which is honey-combed with a labyrinth of tombs running in every direction. In these bassi-rilievi and figures in *terra-cotta* have been found, which prove them to be long anterior to the Christian era. In Peru and other parts of South America, C. have been discovered. The C. in Paris are a species of charnel-houses, into which the contents of such burying-places as were found to be pestilential, and the bodies of some of the victims of 1792, were cast.

CATAFALCO (Ital. a scaffold), or CATAFALQUE, a temporary structure of carpentry, intended to represent a tomb or cenotaph, and adorned with sculpture and painting. It was employed in funeral ceremonies. The most magnificent C. ever made, perhaps, was that used at the interment of Michael Angelo, at Florence.

CATAHOU'LA, a parish in Louisiana, on the Tensas, Black, and Saline rivers; 1770 sq.m.; pop. '80, 10,287—4558 colored. The soil is fertile, producing corn, cotton, etc. Seat of justice, Harrisonburg.

CATALA'NI, ANGELICA, a highly celebrated Italian singer, b. at Sinigaglia, in central Italy, some say in 1780, others in 1784, educated in the convent of St. Lucien, near Rome, where, in her seventh year, she displayed such wonderful vocal powers that strangers flocked from all quarters to hear her. She made her first public appearance at Venice in her 16th year, and experienced a succession of triumphs in every country in Europe for more than 30 years, amassing immense sums of money. The Italian opera in Paris was twice under her direction; but her husband's interference and extravagance brought her into much trouble. Her large queenly person and fine countenance, the immense volume, range, and flexibility of her voice, her power of sustaining her notes, in constrast with the lightness and facility of her unerring execution, everywhere took her audience by storm. Her expression, although fine, and her whole style, surprised rather than touched the heart. In concert singing, her great triumphs were in Rhode's air with variations, and *God Save the King*—which she would call *shave;* and in oratorios, Luther's hymn, her delivery of which, especially when her marvelous voice alternated with the trumpet's sound, was so sublimely awful, that the audience were hushed and pale, and some were borne away fainting. The throat from which these wondrous sounds proceeded was physically of such dimensions, that a physician, when called to look into it, declared he could have passed down a penny-loaf! In 1830, Madame C. purchased a villa near Florence, formerly belonging to the Medici family, where she gave free instructions to girls who had a talent for singing, on condition of their taking the name of Catalani. In the spring of 1849, when political disturbances broke out in Tuscany, she repaired with her daughters to Paris, where she died of cholera on the 13th of June.

CATALAUN'IAN PLAIN (*Campi Catalaunici*), the ancient name of the wide plain surrounding Chalons-sur-Marne, in the old province of Champagne, France, celebrated as the field of battle where the west Goths, and the forces under the Roman gen. Aëtius, gained a great victory over Attila in 451 A.D. A wild tradition (made the subject of a striking picture by Kaulback, "Die Hunnenschlacht," or "The Battle of the Huns") tells that three days after the great fight, the ghosts of the fallen myriads appeared on the plain, and renewed the conflict.

CATAL'DO, SAN, a t. of Sicily, in the province of Caltanisetta, and 5 m. w. of the town of that name. There are productive sulphur-mines in its vicinity. Pop. 12,800.

CATALEPSY (*katalepsis,* a taking possession of), a state of more or less complete insensibility, with absence of the power of voluntary motion, and statue-like fixedness of the body and limbs in the attitude immediately preceding the attack, a like position being also retained, unless altered by force, until the return of consciousness. Such is the abridged description of C., as commonly given in works of authority. The patient is usually in good health at the time of seizure, or subject only to nervous affections, such as hysteria (q.v.); sometimes the attack is preceded by disappointment, fear, violent exciting or depressing passions, or even religious emotions, being in such cases only an extreme form of what is otherwise called trance, reverie, or ecstasy (q.v.); on other occasions, the apparent cause is more purely physical, as in some of the hysterical cases, depending on suppressed menstruation. In all cases of cataleptic rigidity and insensi-

bility, it may be presumed that the brain, as the organ of consciousness, is disturbed; but it does not appear that in any considerable proportion there is structural disease. Patients rarely die during the attack, which may, however, be protracted for an indefinite period, and may even endanger life indirectly by the debility consequent on imperfect nourishment. The circulation and respiration are, in most instances, little affected; cases, however, have been recorded in which, in consequence of their failure, the patient has been supposed to be dead. See DEATH. Many of the recorded cases of C. are little worthy of credit, and it has even been doubted whether this curious disease can ever be said to exist exempt from some degree of deception, or at least voluntary and conscious regulation of the muscles on the part of the person affected. The combination of C. with hysteria, and its frequent association with what are called the higher phenomena of mesmerism (see ANIMAL MAGNETISM), are undoubtedly circumstances of great suspicion; but it would certainly be wrong to suppose that all the cases described were fictitious, and not less so to classify them all under the head of pure imposture. Epidemic C. has been described, and in such cases it would appear plain that the principle of imitation, so powerful in producing nervous disease, must have been at work. The remedies of C. are the same as those of the states to which it is so nearly allied, and of which it may be said to form a part. Moral means form a large part of the treatment, as in hysteria. In some cases, it may become necessary to adminster food by means of the stomach-pump, and this even for weeks or months. We have seen such a case end in complete recovery.

CATALOGUE (Gr. a list). See BIBLIOGRAPHY, BRITISH MUSEUM, LIBRARY, STARS.

CATALO'NIA (Spanish, *Cataluña*), an old province and principality of Spain, now divided into the provinces of Barcelona, Tarragona, Lerida, and Gerona, the total area being 12,180 m., and the pop. '77, 1,749,710. C. occupies the north-eastern corner of Spain, having France on the n., and the Mediterranean on the e. and s.e. It is watered by the Llobregat and the Ter, and by some of the affluents of the Ebro, the last-mentioned river having its embouchure in Catalonia. The coast is rugged, its boldest promontories being capes Creus and San Sebastian, and its deepest indentations the bays of Rosas and Tarragona. With the exception of a few low plains of limited extent, the soil of C. is that of a wild mountainous region formed by numerous offsets or terraces of the Pyrenees, one great ridge or series of ridges extending through the center of the province.

The terraces, sloping abruptly down to the coast, or to the narrow coast plains, are divided by the valley of Llobregat into the lower and the upper Catalonian mountains.

The climate of C., though fog and rain are frequent, and extreme and rapid changes of temperature prevail, is on the whole healthy and favorable to vegetation. Near Barcelona, oranges flourish in the open air; the fields in some parts are bounded by aloe-hedges, and olives grow on Montserrat. Cork-trees grow on the mountains, and thickets of thorn-apple, laurel, myrtle, pomegranate, box, rosemary, etc., extend where the cork has its limits. Northern upper C. has a more severe winter than the s.; but everywhere vineyards and olive-gardens cover the slopes, and cornfields extend in the valleys. Among the other products are hemp, flax, madder, barilla, and saffron. Hazel-nuts, a variety called Barcelona nuts, are extensively grown. Meadow-lands and pastures are comparatively rare, and horned cattle are, therefore, mostly confined to the districts bordering on the Pyrenees; while few horses and mules are kept; but sheep, goats, and swine are bred in considerable numbers. Silk-worms and bees are also reared. The coasts abound with fish, and game is plentiful. The minerals are coal, copper, manganese, zinc, lead, cobalt, salt, sulphur, and many varieties of marble.

C. is the principal manufacturing province of the kingdom—is, in fact, "the Lancashire of Spain." The inhabitants are neither French nor Spaniards, their language, costume, and habits being quite distinct from those of either; they have also local coins, weights, and measures. In energy, industry, and intelligence, they greatly surpass the rest of the Spaniards.

C., under the name of *Hispania Tarraconensis*, was one of the earliest, and remained among the last of the Roman provinces. It was invaded and captured by the Alans, who were followed by the Goths, hence its name *Gothalania*, changed into Gothalunia or Catalonia. In the 8th c., the Arabs gained possession of the southern part. When Charlemagne, in 788, subjugated Spain as far as the Ebro, C. formed the central portion of the Spanish mark, governed by French counts, having Barcelona as their residence. They soon made themselves independent of France. In 1137, earl Raymund Berengar, by his marriage, united C. with Aragon; and the marriage of Ferdinand and Isabella (1469) united both with Castile, and so C. became a portion of the Spanish monarchy, but never a very peaceable one. In modern times it has repeatedly taken a prominent share in Carlist or other insurrections.

CATAL'PA, a genus of trees of the order *bignoniaceæ*. The *catalpa syringifolia* is a native of the s. portion of the United States, and is cultivated there and in the cities of the northern states as an ornamental shade-tree. It may be known by silver-gray bark, wide-spreading but few branches, and the fine pale green of its large heart-shaped leaves. The flowers are white, tinged with violet or purple, and dotted with the same colors. The flowers are succeeded by long bean-like pods, that sometimes hang on the

otherwise bare limbs all winter. The wood is light and of fine texture, and useful in cabinet work. There is a catalpa in London said to have been planted by lord Bacon.

CATAL'YSIS (Gr. dissolution) is a term applied in chemical physics to a force supposed to be exerted by one substance upon a second, whereby the latter is subjected to change or decomposition, whilst the former, or acting substance, remains comparatively unaltered, and does not combine with it. The force, indeed, has been ascribed to the mere "action of contact." Fermentation is an example of this force (see BEER), when one part of yeast acting upon the sugar of the sweet worts, without entering into combination with it, compels 100 parts of sugar to pass into alcohol and carbonic acid. Germination, or the sprouting of grain when placed in the ground, is another example where one part of *diastase* changes 1000 parts of starch into sugar. No plausible theory has been brought forward to account for these changes, or to define what the force of C. is. Liebig has suggested, as an explanation, "that a body in the act of combination or decomposition enables another body with which it is in contact to enter into the same state;" but this view does not explain C., as that force does not act in the majority of cases where changes are proceeding, and, moreover, the acting substance, while changing itself, never throws the body acted upon into the *same state of change*, but causes it to assume a new series of changes different from those pursued by itself.

CATALYSOTYPE, a name given by its inventor, Dr. Wood, to a modification of the calotype process, upon the assumption that light set up a catalytic action (see CATALYSIS) among the ingredients employed. The paper is first washed with very dilute hydrochloric acid, to prevent the formation of yellow patches of insensitiveness, and then treated with sirup of iodide of iron containing a trace of free iodine; it is then partially dried between folds of blotting-paper, and sensitized by brushing over it a solution of nitrate of silver of ten grains to the ounce. Immediate exposure in the camera follows; after which, though no picture be visible at first, if it be allowed to remain in the dark for a period which varies with the length of time it was exposed, and the amount of light, a negative picture of great perfection is gradually developed. It is not necessary, however, for the explanation of this phenomenon, to assume, that a catalytic action is set up, inasmuch as the ordinary chemical reactions are quite sufficient to account for it. As soon as *nitrate of silver* comes in contact with the moist *iodide of iron* with which the paper is first imbued, an interchange of elements takes place, *iodide of silver* is precipitated in the pores of the paper, and *protonitrate of iron* is diffused over the surface; and this latter salt is even a more energetic developing agent than the ordinary gallic acid, hence the seemingly spontaneous appearance of the picture. This process is so uncertain in its results, that it is seldom practiced.

CATAMARAN' is a raft formed of three planks lashed together, the middle one serving as a keel, and the other two for the sides. The rower stands or kneels on the middle plank, and works a paddle. These simple vessels are used by the natives of Madras, to maintain communication between ships and the shore, ordinary boats being rendered unsafe by the surf. By the adoption of a similar construction on a larger scale, some of the catamarans are made large and strong enough to carry goods, and even artillery. Catamarans used in Brazil consist simply of three logs of wood tapered at the end and lashed together; they carry a sail.

CATAMAR'CA, a province in the Argentine republic, between 25° and 29° s., and 66° and 69° w., lying at the foot of the Andes; 35,500 sq.m.; pop. '69, 79,962; the greater portion being of pure Indian blood. The province is intersected by several mountain-chains; and by many small streams, most of them dry in the summer, but in winter subject to destructive floods. Some of the plains are sandy deserts, while others are periodically inundated; and when the water dries away, it leaves a coating of salt, which is gathered for home use and for trade. Gold, silver, and copper are found, the latter in abundance; and nearly all the fruits and grains of tropical and temperate regions are grown. The cotton of C. is especially esteemed. Among the animals are large herds of alpaca, llama, and vicuna, and also horned cattle, asses, and mules. The main exports are wines, brandy, raisins, hides, leather, tobacco, cochineal, and copper. The people are occupied in agriculture, and in manufactures of earthenware, and fabrics made from the wool of the alpaca and kindred animals. The chief town and capital is the city of the same name.

CATAMAR'CA, the capital of the province of Catamarca, in the Argentine republic, 28° 20′ s., 66° 25′ west. It is a regular and moderately well-built town of about 6000 inhabitants. Of public buildings, there are a town-house, a Franciscan monastery, and a convent. There is considerable import-trade of European goods, and the place is a center of distribution for a flourishing district. Dried figs, wines, brandy, and cotton are the principal articles of export.

CATAME'NIA. See MENSTRUATION, *ante*.

CATAMOUNT. See PUMA, *ante*.

CATA'NIA, or CATANEA, a city and seaport of Sicily, situated on the e. coast, near the foot of Mt. Etna, 31 m. n.n.w. of Syracuse. The fertile and well-cultivated neighborhood of C., extending along the s.e. base of Mt. Etna, is styled "the granary of Sicily," and has given to C. the title, "La Bella Catania." By eruptions of the great

volcano and attendant earthquakes, the city has been several times almost entirely destroyed, especially in the year 1693; but out of its ruins it has always risen with increased beauty, and it is now the finest city in Sicily, being built throughout on a beautiful and consistent plan, from which no deviation is allowed. The harbor of C., formerly good, was choked by a stream of lava in 1693, and the mole was partly destroyed, so that now it has only a roadstead, which is guarded by a fort, and serves as a landing-place. It has several squares, the finest of which, in front of the cathedral, has a statue of an elephant sculptured in lava. Among its chief public buildings are the Benedictine convent and church of San Nicolo, with one exception the grandest structure of the kind in Europe; the town-hall; the cathedral, with its noble granite columns; and the university, founded in 1445. It has besides many handsome churches and convents, and several educational and charitable institutions, and is the seat of one of the three high courts in the island. The inhabitants, formerly much more numerous, amounted in 1881 to 97,355, and are distinguished by their commercial spirit and industry. C. has manufactures of silk and linen goods, and of articles in amber, lava, wood, etc. Among the remains of ancient times, that earthquakes have spared, are those of a theater, an odeium, a temple of Ceres, Roman baths, and an aqueduct. C., anciently known by the name of *Catana*, was founded by a Greek colony of Chalcidic origin, in the latter part of the 8th c. B.C.; and as early as the beginning of the 5th c. B.C., it was esteemed one of the most flourishing towns in Sicily. It was taken by the Athenians under Nicias, and was desolated by Dionysius I.; but again rose under the Roman sway into its former importance. Augustus here founded a Roman colony. It suffered at the hands of the Goths, but once more, under the Byzantine empire, became one of the principal cities in the island. C. gives name to the province of which it is the capital, and which is one of the richest in Sicily, with an area of 1743 sq. miles, and a pop., in 1872, of 479,850.

CATA'NIA, GULF OF, an inlet of the Mediterranean, on the e. coast of Sicily, extends in the form of a semicircle from La Trezza bay to cape Santa Croce, a distance of 18 miles. It is about 10 m. deep, and receives the river Giaretta.

CATANZA'RO, a city of s. Italy, in the province of the same name, is beautifully situated on the declivity of a rocky hill, near the gulf of Squillace, and in the midst of a very fertile district. On account of its agreeable climate, many wealthy families have made it their residence. It has a cathedral, an old castle of the Norman period, a college, one of the largest, as it is one of the best conducted in the country, and is the seat of one of the four great civil courts of the kingdom. C. suffered very severely by an earthquake in 1783. It has manufactures of silk-velvet and woolen fabrics, and an active trade in agricultural produce. Pop. '81, 20,931.

CATAPLASM (a Greek term for a poultice), an application to diseased or painful parts, for the purpose of promoting suppuration, relieving pain, and stimulating or soothing the skin, according to circumstances. A C. may be composed of any moist pulpy substance of sufficient consistence to retain the water without dripping or soaking through the thin muslin covering in which it is generally wrapped. The making of a poultice well is a matter of some nicety, and unless the proper consistence is given to the mass, the application is apt to do more harm than good. The linseed-meal poultice is the most easily made, and most satisfactory of all soothing applications. The meal is stirred gradually into a sufficient quantity of boiling water, placed in the bottom of a small basin or teacup, until a perfectly smooth pulp is formed of the proper consistence, and in quantity sufficient to cover completely, to the thickness of three quarters of an inch, the whole pained part. The pulp is then folded up in muslin or thin calico, and applied as soon as the heat will permit it to be borne. The bread and milk, or even bread and water poultice, is also very good; as is also the oatmeal-porridge poultice, to which a little butter may be added with advantage. A spoonful or two of yeast may be added, if there are foul discharges, or peat charcoal may be sprinkled on the surface of the poultice before it is applied. Carrot poultices are in great favor with the people in some parts of the country. Hemlock poultices, made of the fresh leaves, or of the dried leaves, with the aid of some powder of the leaves, form a valuable sedative application in painful diseases; and poppy-heads, or even opium, are sometimes infused in the water of which a poultice is made, for the same purpose. A stimulating C. or poultice may be made by sprinkling oil of turpentine, or chloroform, or mustard in moderate quantity on the surface of any ordinary poultice. When considerable irritation of the skin in a short time is desirable, a mustard C. or sinapism (*sïnapi*, mustard) is used.

CATAPUL'TA, an engine of war used by the ancients, somewhat resembling the crossbow. In the C., a string or rope, suddenly freed from great tension, gave a powerful impulse to an arrow placed in a groove. There were great catapultas fixed upon a scaffold with wheels, which were used in sieges, and small ones, carried in the hand, which were employed in the field. For a description of similar engines of ancient warfare, see articles BALISTA and ARBALEST.

CATARACT, an opaque condition of the lens of the eye. It is readily distinguished from opacities of the cornea, or clear front part of the eye, by its position just behind the pupil—that round and varying aperture in the iris through which light is admitted

into the back of the eye. C. may affect the lens alone (lenticular C.), or the front or back of the capsule of the lens (capsular C.), or both lens and capsule (capsulo-lenticular cataract). Its whiteness varies from that of half-boiled white of egg to that of snow. Heat will produce a like change on the lens out of the body, just as it changes white of egg from transparent to opaque. The rounded lens of the fish is seen at table in this opaque condition.

C. is painless, and unaccompanied by inflammation. It occasions blindness simply by obstructing the passage of the light; but C. alone does not produce so complete blindness but that the patient can tell light from darkness. It may occur at any age, but is most common in elderly persons, and is not unfrequent in children, who may be even born with it. The catoptric test, as it is called, is an ingenious method of distinguishing incipient C. from certain other deep affections of the eye. When a lighted candle is held before the eye of a person whose back is to the window, three candles are seen in the healthy eye. Two are erect—the large front one caused by the convex cornea, the smaller and fainter one behind by the convex front of the lens. The third, occasioned by the concave back of the lens, is in the middle; is small, bright, and turned upside down; and, when the candle is moved, goes in the opposite direction, while the two erect images move with the candle. When the back of the lens becomes opaque, the inverted image is obscured or disappears; and when the front of the lens is affected, only the great front image, caused by the cornea, remains. This curious experiment may be tried on a large scale, by holding a common bi-convex lens a little way behind a watch-glass. Then, on greasing the back of the lens, to imitate C., the inverted image disappears, and on turning the lens round, all but the image in the watch-glass disappears.

No medical or other treatment has any influence in arresting the progress of C., nor can it be cured but by a surgical operation. A clever imposture used to be practiced by quacks. By applying belladonna to the eye—as the surgeon does when he wishes to dilate the pupil for an examination or operation—some little light was temporarily admitted through the less opaque edge of the lens. The patient beginning to see somewhat better, after long and increasing dimness of vision, began to congratulate himself on a cure; the quack, of course, hastened to get his money without waiting for the further result, which was sure to be blank disappointment. So long as there is fair vision with one eye, the operation on the other may be delayed. It is a mistake to delay the operation in children on account of their tender age. The sooner it is done the better, both for the eye and the education of the child.

Three methods of operation are practiced. 1. For *absorption* or solution. This is suitable for children, in whom the C., like the natural lens, is soft, and in all other cases in which there is reason to suppose that the C. is soft. An appropriate needle is passed through the cornea; made to open and lacerate the front of the capsule, the rags of which curl out of the way behind the iris, so that their subsequent opacity does not obstruct the light; then the soft cataractous lens is punctured and picked so as more effectually to admit the aqueous humor, which naturally fills the space between the lens and the cornea, and which has the remarkable property of absorbing or dissolving the lens or cataract when admitted within the capsule. This operation may require to be repeated several times, at intervals of a few weeks, before the whole C. is dissolved. 2. *Displacement.* A needle is passed through the fore part of the white of the eye, until it is seen through the upper part of the pupil, lying across the front of the upper part of the lens. This is now pressed back, so as to make the lens sink down and back into the vitreous humor, when it is either slowly absorbed, or may in part permanently remain. The older method of displacement, termed couching, in which the lens was pushed more directly downwards, is now abandoned, as more likely to press on the retina, and cause subsequent evil to the eye. 3. *Extraction.* Half the cornea, through nearly its whole breadth, is divided with Beer's knife, an operation requiring great skill; the front of the capsule is opened, and disposed of with a needle; and the lens is gently assisted out of its place, through the pupil, and out of the opening in the cornea, great care being taken not to allow the vitreous humor to follow. Displacement and extraction are both applicable to hard cataracts, the form it generally takes in old age, as the lens itself becomes naturally harder with age, as well as more flat and amber-tinted. Displacement is more likely to be followed by bad consequences, some time after, from the presence of the displaced lens, while the risk of extraction is greater at the operation. The surgeon must decide which is best for each case. Though not so simple and successful as the operation for absorption through the cornea for soft C., displacement and extraction are generally very successful in restoring vision. The place of the lens is supplied by fluid humor, the refracting power of which is nearly equal to that of the lens, and the restoration of vision may be perfect. All of these operations require minute anatomical knowledge (see EYE), and great nicety and skill in the use of the instruments.

CATARACTS and RAPIDS. See WATERFALLS, *ante*.

CATARRH (Gr. *katarreo*, I flow down), a disease of great frequency in temperate latitudes, especially in changeable moist climates in the winter season. From its well-known connection with sudden falls of temperature, and other epidemic or atmospheric causes (see INFLUENZA), as also from the chill often experienced at the commencement

of the disease, it is popularly called *a cold*—a term, however, perhaps somewhat less definite in its meaning than C., which word is usually restricted to the case of a cold affecting the chest, and attended with discharge of mucus by coughing. A "cold in the head" is termed, in strict scientific language, *coryza;* we shall, however, keep both forms in view in the present article. C., or cold, commonly begins with a feeling of chilliness, which may or may not be attributable to external causes. Sometimes this is absent, there being only a sense of languor and indisposition; not unfrequently there is no sensation of an unusual kind, until a stuffing is experienced in the nostrils, or severe headache, or hoarseness with cough, or oppression of the breathing. The regular form of a cold is to attack the nostrils first, and afterwards the air-passages leading to the chest. When it habitually attacks the chest, without running through its ordinary course as indicated above, there is often some special cause of delicacy in the lungs, or some constitutional tendency towards consumption (q.v.). The discharge is in the beginning watery, becoming afterwards more abundant, glairy, and of yellowish color; the early stages of the disease are attended by considerable irritation of the surfaces affected, and probably no one of the little miseries of life is more prostrating and discouraging for the time than a bad cold in the head. The tendency of C. to attack the chest, and thus to pass into bronchitis or pneumonia (q.v.), or to lay the foundation of tubercular disease, constitutes almost its only danger. See CHEST.

The treatment of a cold is commonly a simple matter, so far as the particular attack is concerned. Confinement to the house, and, in severe cases, to bed, or to the sofa, for a day or two; a warm hip or foot bath, to remove the chill; light farinaceous diet, and, if the stomach and bowels are at all loaded, a dose or two of some gentle laxative, are commonly sufficient to subdue the disease. Some persons cure their colds by entire abstinence from food, and as much as possible from drink; others by a large opiate, or by a succession of doses of Dover's powder; others by spirit of mindererus and paregoric; some even profess to carry out the popular maxim, "stuff a cold, and starve a fever," and maintain that a good dinner, and a tumbler of whisky or brandy toddy, are the best specifics. That colds get well under all these methods, needs not be denied; but that any violently perturbative or specific practice assists the cure, or shortens the disease, has yet to be proved; and multiplied experience has shown, that "stuffing a cold" is by no means to be commended. In the later stages, however, a more liberal diet than at first, and in some cases even a moderate allowance of stimulants, affords considerable relief from the feeling of depression that remains for a time on the subsidence of a catarrh. The tendency to this disease, when habitual, and when not dependent on any form of constitutional disorder requiring special means for its cure, is best met by the daily use of the cold bath, with frequent exercise in the open air, and proper ventilation of the sleeping-apartment; also by friction of the skin, and by clothing, which, without being oppressive, is comfortably warm. Exposure to draughts or sudden chills, when the surface is perspiring, is to be avoided; but a close confined air habitually breathed in a workshop or bedroom, is a fruitful predisposing cause of the disease.

CATASAU'QUA, a t. in Lehigh co., Penn., on Lehigh river, 3 m. above Allentown; pop. '80, 3,065. The Lehigh Valley and the Lehigh and Susquehanna railroads unite here.

CATASTROPHISM. See page 890.

CATAW'BA, a light sparkling wine, of rich muscadine flavor, produced in the neighborhood of Cincinnati, Ohio, U. S. It is made from a grape called the Catawba grape, "first found growing on the banks of the Catawba river, in Carolina." This wine, which is scarcely known in England, is now in extensive use in North America, where it is gradually superseding the importation of the Rhenish and French sparkling wines, to which, in general character, it bears a resemblance. The vineyards where the C. is produced are situated on the steep and beautiful slopes with a southern exposure on the banks of the Ohio river, under the shelter of high hills on the north. The first great grower of the C. was Mr. Longworth, an esteemed and wealthy proprietor in this quarter, who, embarking in the pursuit less on business considerations than as an enthusiast, succeeded, after much patient care and expense, in producing a wine that throughout the states finds more favor, and commands a higher price, than the choicest wines imported. Some of the finer kinds of C. rival the best champagne in delicacy and purity, and are not to be confounded with inferior American imitations.

CATAW'BA, a co. in w. North Carolina, on the Catawba river, crossed by the Western North Carolina railroad; 250 sq.m.; pop. '80, 14,946—2474 colored. It has a varied surface and fertile soil, producing wheat, corn, oats, etc. Iron ore is found in abundance. Co. seat, Newton.

CATAW'BA, or GREAT CATAWBA, a river rising in the Blue Ridge in n.w. North Carolina, and flowing e. and s. through the gold region of that state into South Carolina, where it takes the name of the Wateree and joins the Congaree, the two forming the Santee. The C. is about 250 m. long.

CATAW'BAS, Indians of North Carolina, once a large tribe in the region of Catawba river, but now a mere remnant. At the time of the early white settlements, they could muster many thousands of warriors, and as late as the revolution were able to furnish a valuable contingent to the Carolina troops. They occupied several towns

along the river that still bears their name; but at last leased the lands to the whites, and removed into the territory of the Cherokees, with whom they had been at war. After a short residence they returned to a reservation in their original district. Their language is closely allied to that of the Waccoes and the Caroline tribe. Peter Harris, a revolutionary soldier, was said to be the last full-blooded survivor of the Catawba tribe.

CATBALO'GAN, or CADVALONGA, a t. of the Philippines, capital of the island of Samar, on a small bay on the w. coast. The houses are mostly constructed of nipa palm, but there are some of stone. Pop. about 7,000.

CAT-BIRD, *Turdus felivox*, an American thrush, of the same group with the mocking-bird, which it resembles in its vocal powers. It is a bird of passage, making its way northward in spring through Georgia and Carolina as far as Massachusetts. It feeds on fruit and berries of all kinds, worms, and insects; builds a large nest of dry twigs, weeds, etc., without any attempt at concealment, in a bush or tree, often in the immediate vicinity of human habitations, and shows extraordinary boldness in the defense of its young. It has its name from a mewing cry which it utters when annoyed by an intruder approaching too near its nest.

CATCH, a species of musical composition peculiar to England, and in the canon style. The words of the C. are generally humorous, and intended to be sung in social parties over a glass. The music is generally for three voices, of which there exist hundreds of specimens from the time of Purcell to the present day. As in the canon, each voice takes up the subject at a certain distance after the first has begun. One of the best specimens of a C. is by Calcott, on Hawkins' and Burney's histories of music, where the humor lies in one of the parts repeating "Burney's history"—sounding like "burn his history"—while the others are advocating Hawkins.

CATCH-DRAINS, open drains, and sometimes covered drains, along a declivity to intercept and carry off surface water.

CATCHFLY, the common English name of several plants of the natural order *caryophyllaceæ*—as *silene armeria, S. Anglica, lychnis viscaria*, etc.—which being clammy, in consequence of a peculiar exudation, on the calyx, on the joints of the stem, etc., often prove fatal to insects settling upon them. See LYCHNIS and SILENE.—The name is sometimes employed by botanists as a sort of popular equivalent to *silene.—Dionæa muscipula* is also sometimes called the Carolina catechism. See DIONÆA.

CATCHPOLL, a sheriff's officer, or bailiff, is so called in England, probably because he was in use to catch his victim by the *poll*, or head.

CATEAU, LE, or CATEAU-CAMBRESIS, a t. of France, in the department of Nord, situated on the Selle, 14 m. e.s.e. of Cambrai. C. has manufactures of shawls, merinoes, calicoes, and leather; it has also breweries and distilleries. Pop. 76, 9,444. It is celebrated as the place where, in 1559, the treaty known as that of Cateau-Cambresis was concluded between Henri II. of France and Philip II. of Spain, by which the former monarch ceded to the latter, Savoy, Corsica, and nearly 200 forts in Italy and the low countries.

CATECHETICAL SCHOOLS, the name given to the ancient Christian schools of theology, of which the chief were those of Antioch and Alexandria. Clement and Origen were the most famous of the teachers.

CATECHISM, from a Greek word, *katēcheō*, which means to resound, or sound into one's ears; hence to instruct by word of mouth. Pesons undergoing instruction in the principles of Christianity were hence called *catechūmens* (*katēchoumenoi*), and the teacher appointed for this purpose was called a *catechist.* Hence any system of teaching by question and answer is called a catechism.

Catechisms have long formed one of the principal means employed for popular instruction in the truths and duties of the Christian religion. The composition of the first catechisms was, in all probability, suggested by the ordinary oral instruction of catechumens, and was intended for the help both of teachers and pupils. It appears to have been in the 8th and 9th centuries that the first regular catechisms were compiled, of which that by Kero, a monk of St. Gall, and that ascribed to Otfried of Weissenburg, are among the most noted. At later periods, the use of catechisms prevailed chiefly among the opponents of the hierarchy, as among the Waldenses, the Albigenses, the Wickliffites, and, above all, among the Bohemian brethren. The term C. appears to have been first employed in its present sense among the latter. At an early period in the history of the reformation, the reformers began to avail themselves of this method of popular instruction, and their catechisms became important instruments in that great religious movement. In 1520, Luther published his first short catechism. In 1525, Justus Jonas and John Agricola were intrusted with the preparation of a catechism. In 1529, Luther published his larger and smaller catechisms, which found a place among the symbolical books or standards of the Lutheran churches. A number of catechisms were published also by the Swiss reformers, and by those of England and other countries. The Geneva catechisms, larger and smaller, were the work of Calvin. They were published in 1536, were speedily translated into various languages, and became acknowledged standards of the reformed churches, not only in Switzerland but in the low countries, in France, and

in Hungary. The church of Geneva has set aside the authority of these catechisms.—The Zurich C. is received as a standard in the church of Zurich.—The Heidelberg or palatinate C. is of greater importance, however, than any other as a standard of the Swiss reformed churches. It was compiled by the Heidelberg theologians, Caspar Olevian and Zacharias Ursinus, at the request of the elector Frederic III. of the palatinate; it was published in 1563, was approved by several synods, and was subjected to a revision by the synod of Dort.—In the church of Rome, the Romish or Tridentine C. is of high authority. It was prepared in accordance with the decrees of the council of Trent, by archbishop Leon. Marino, bishop Ægidius Foscorari, and the Portuguese dominican, Francis Fureiro; revised by cardinals Borromeo, Sirlet, and Antonian, and sanctioned by pope Pius V. It was published at Rome in 1566—The C. of the Orthodox Greek church was prepared by Peter Mogilas, metropolitan in Kiew, and published in 1642. It received authority as a standard or symbolical book from a synod at Jerusalem in 1672. It is often called the larger Russian C., to distinguish it from the smaller C., prepared by order of Peter the great.—Besides these catechisms, which have a historic interest, or are of importance from their symbolical character, there have appeared at all periods, since the reformation, many others, both Protestant and Roman Catholic, some doctrinal, some controversial, some devoted to particular subjects, as the sacraments, or to particular purposes, as the preparation of candidates for admission to the Lord's supper, some adapted to the mental capacity of very young children, etc. The opinion, however, has become prevalent, that doctrinal abstracts are not the best form in which religion can be presented to the young, and the use of catechisms has accordingly been in some measure relinquished in favor of other methods of instruction.

The C. of the church of England, with which we are most familiar, is the smaller one published in the book of Common Prayer. It is in two parts: the first contains and explains the baptismal covenant, the creed, the ten commandments, and the Lord's prayer; the second explains the two sacraments, baptism, and the Lord's supper. It is not known with absolute certainty who was the author of the first part; probably Cranmer and Ridley had the principal hand in framing the questions and answers. It was originally put forth with the 42 articles in the reign of Edward VI., and condemned as heretical in the reign of Mary. It must not be confounded with Cranmer's C., which was a larger work, differently arranged, and translated chiefly from the German C. used in Nuremberg. This first part of the church C. is spoken of as the *shorter* catechism.

There was a *larger* church C. compiled also in the reign of Edward VI., by Ponet, as is supposed, and it corresponds in some degree with the smaller work above described. It was afterwards revised and enlarged by Noel, dean of St. Paul's, and published in 1570; and though never officially promulgated by the church, it has some authority from having been approved by the lower house of convocation. At the Hampton court conference, in the reign of James I., the *shorter* C. was considered too short, and the larger one of Noel's too long; and accordingly, at the king's suggestion, an addition was made to the former of that explanation of the two sacraments which now forms the second part of the church catechism. This was drawn up by Dr. Overall. The whole is a work much esteemed by all sections of the church, as remarkable for its simplicity, truth, and catholicity. It, however, states the baptismal theory in a way that is not very acceptable to the extreme low church party. The rubrics in the Common Prayer book enjoin the teaching of the C. in the church on Sundays and holidays after the 2d lesson at evening prayer; and the 59th canon contains a like injunction, imposing penalties on the clergy who neglect this. The custom of catechizing in the church had fallen into almost universal disuse, but in many parishes it has been revived with excellent results.

The larger and shorter catechisms, which, with the Westminster confession of faith, constitute the standards or symbolical books of the Presbyterian churches throughout the British empire and the United States of America, were compiled by the assembly of divines at Westminster (q.v.): the shorter C. "to be a directory for catechizing such as are of weaker capacity;" the larger, "for catechizing such as have made some proficiency in the knowledge of the Christian religion." The shorter C. was presented to the English house of commons on 5th Nov., 1647; the larger on the 14th April, 1648; and in July, 1648, both received the sanction of the general assembly of the church of Scotland—the general assembly, in the act approving of the larger C., declaring it to be "a rich treasure for increasing knowledge among the people of God," and that "they bless the Lord that so excellent a catechism has been prepared." The shorter C. has, however, been far more generally used for the purpose of instruction than the larger, which has been generally felt to be too minute in its statements, and too burdensome to the memory to be employed as a catechism. Even the shorter C. is regarded by many, who substantially adhere to its doctrine, as carrying the statement of dogmatic theology beyond what is proper for elementary instruction, whilst it has been long felt to be unsuitable for the very young and the very ignorant, and its use is now almost always preceded by that of catechisms more adapted to their capacity. Its influence, however, has been very great in forming the religious opinions, and in exercising and training the intellectual faculties, wherever Presbyterianism has prevailed: for it has been, and still

is, in almost universal use among Presbyterians speaking the English language, and to a considerable extent among Independents or Congregationalists both in Britain and America. In Holland also, a translation of it has been much used. It is very generally regarded, by those whose doctrinal views are in accordance with it, as an admirable compend of Christian doctrine and duty.—The authorship of the Westminster assembly's catechisms has been the subject of much debate, or at least the authorship of the first drafts of them; it being admitted that they were prepared with great care by committees of the assembly. But the probability appears to be, that their authorship is to be ascribed entirely to these committees; and that, like the Westminster confession of faith, they are thus the result of the joint labors of many. From discoveries made by the late Dr. M'Crie, it seems probable that at least the plan or scheme of the shorter C. is to be ascribed to Mr. Palmer.

CAT'ECHU, a substance employed both as a coloring matter and medicinally as an astringent. The C. of commerce is obtained chiefly from East Indian trees, such as the C. tree (*acacia catechu*), betel-nut, etc.; but the greater part of that which is exported from India is made from the C. tree. It is known in India by the name *kutt;* and C. is said to be a name compounded of two words signifying *the juice of a tree* (*cate,* a tree, and *chu,* juice). Cutch is another form of one or other of these names, and is a common commercial name. The heart-wood alone of the tree yields C., which is obtained by cutting it into small chips, and boiling it in water, straining the liquid from time to time, and adding fresh supplies of chips, till the extract is of sufficient consistence to be poured into clay molds, which are usually of a square shape; or when of the thickness of tar, it is allowed to harden for two days, so that it will not run, and is formed into balls about the size of oranges, which are placed on husks of rice or on leaves, and appear in commerce enveloped in them. The C. manufacturers in Northern India move to different parts of the country at different seasons, and erect temporary huts in the jungles, where they carry on their operations. The C. tree abounds chiefly in the Bombay and Bengal presidencies; it is a small, erect, thorny tree, with a roundish head of (generally) prickly branches. Its sapwood is yellow, the heart-wood dark red. C. is brittle, and can readily be broken into fragments; is soluble in water, and possesses an astringent taste, but no odor. It is a very permanent color, and is employed in the dyeing of blacks, browns, fawns, drabs, and greens. It contains much tannin, and an acid called catechuic acid, which can be isolated in white silky crystals. It is often adulterated with earthy substances, but its ready solubility in water and alcohol, should at once show the presence of such, by leaving them behind in an insoluble state.—The C. of the betel-nut is obtained by boiling first the nuts, and then the extract to a proper consistency. A first boiling of the nuts for some hours is said to yield a black kind of C., called *kassu;* and a second boiling, after the nuts are dried, a yellowish-brown kind, called *coury,* which is considered the best, and is sold for the highest price. The former appears in commerce under the name of colombo C. or Ceylon C. (or cutch) in the form of circular flat cakes, covered on one side with husks of rice. The latter does not seem to reach Europe.—Gambir (q.v.) may be regarded as a kind of catechu. Kino (q.v.) is sometimes confounded with catechu. *Terra Japonica,* or Japan earth, is an old name for C., not quite disused, which was given to it on the supposition of its being an earthy substance brought from Japan.

CATECHU'MENS (Gr. persons undergoing a course of instruction; see CATECHISM), the appellation given, in the early Christian church, to those converted Jews and heathens who had not yet received baptism, but were undergoing a course of training and instruction preparatory to it. They had a place assigned them in the congregation, but were not permitted to be present at the dispensation of the Lord's supper. In the apostolic age, converts appear to have been at once admitted to the sacraments; but afterwards this ceased to be the case, and a period of probation was required. The C. were divided into different classes or grades, according to their proficiency—those of the lowest grade were not permitted to be present during the prayers of the congregation; and those only of the highest, and who had been declared fit to be baptized at the next administration of the ordinance, were permitted to witness the dispensation of the Lord's supper.—The term C. was afterwards employed to designate young members of the Christian church who were receiving instruction to prepare them for confirmation or for the Lord's supper, and it is still often used in this sense.

CATEGORIES. This designation has come down to us from Aristotle. One of the books of his *Organon* or Logical System is so named. The C., or predicaments, as the schoolmen called them, are to be understood as an attempt at a comprehensive classification of all that exists, for the purposes of logical affirmation, proof, or disproof. The entire universe may be classified in various ways—as into things celestial and terrestrial; into matter and spirit; into organized and unorganized; into minerals, plants, animals, etc. But the classification contemplated under the C. proceeds on the very general properties or attributes that most extensively pervade all existing things, although in unequal degrees. A good example is quantity, which pertains to every thing that we know or can think of. We give the Aristotelian enumeration—the first column is the

original Greek; the second, the Latin rendering of the schoolmen; the third, the nearest corresponding English words:

Οὐσία,	Substantia,	Substance
Ποσον,	Quantitas,	Quantity.
Ποιόν,	Qualitas,	Quality.
Πρός τι,	Relatio,	Relation.
Ποιεῖν,	Actio,	Action.
Πάσχειν,	Passio,	Passivity.
Που,	Ubi,	Position in space
Ποτε,	Quando,	Position in time.
Κεῖσθαι,	Situs,	Situation.
Εχειν,	Habitus,	Possession.

Mr. J. S. Mill has the following remarks on the above scheme: "The imperfections of this classification are too obvious to require, and its merits are not sufficient to reward, a minute examination. It is a mere catalogue of the distinctions rudely marked out by the language of familiar life, with little or no attempt to penetrate, by philosophical analysis, to the *rationale* even of these common distinctions. Such an analysis, however superficially conducted, would have shown the enumeration to be both redundant and defective. Some objects are admitted, and others repeated several times under different heads. It is like a division of animals into men, quadrupeds, horses, asses, and ponies. That, for instance, could not be a very comprehensive view of the nature of Relation, which could exclude action, passivity, and local situation from that category. The same observation applies to position in time and position in space; while the distinction between the latter and situation is merely verbal."—*Logic*, book i., chap. iii. § 1. Some writers have endeavored to save the C. from these objections, by declaring that the fourth, Relation, is to be looked upon as a general head, comprehending the remaining six under it. But there is no evidence that Aristotle had this view in his mind; on the contrary, it appears almost certain that his idea of Relation was too narrow and limited to admit of his giving it so great a comprehension.

Mr. Mill gives us the result of his own analysis, the following enumeration and classification of existences or describable things:

1. Feelings, or states of consciousness; which are the most comprehensive experience that the human mind can attain to, since even the external world is only known as conceived by our minds.

2. The minds which experience those feelings.

3. The bodies, or external objects, which are supposed to excite all that class of feelings that we denominate sensations.

4. The successions, and coexistences, the likenesses and unlikenesses, between feelings or states of consciousness. Although the relations are considered by us to subsist between the bodies, or things, external to our minds, we are driven in the last resort to consider them as really subsisting between the states of each one's own individual mind.

Mr. Mill shows that all possible propositions—and it is with the truth or falsehood of propositions that the science of logic has chiefly to do—affirm or deny one or other of the following properties or facts: Existence—the most general attribute of all—Co-existence, sequence or succession, causation—a peculiar case of succession—and resemblance. It is to arrive at this classification of propositions, for the purposes of logic, that the foregoing analysis, corresponding to the Aristotelian C., was made. The properties affirmed of any thing or things, or the things of which any properties are affirmed, come under some one or other of the four heads above given.

The C. of Kant, which are sometimes brought into comparison with those of Aristotle, are conceived under a totally different point of view. See sir W. Hamilton's *Discussions on Philosophy*, 2d edit., p. 26. They refer to certain forms supposed to be inherent in the understanding itself, under which the mind embraces the objects of actual experience. The Kantian philosophy supposes that human knowledge is partly made up of the sensations of outward things—color, sound, touch, etc.—and partly of intuitions existing in the mind prior to all experience of the actual world. This is the point of difference between the school of Locke—who rejected all innate ideas, conceptions, or forms—and the school of Kant. No such question was raised under the Aristotelian categories. Kant's enumeration of his innate forms is as follows: 1. Quantity, including unity, multitude, totality; 2. Quality, including reality, negation, limitation; 3. Relation, including substance and accident, cause and effect, action and reaction; 4. Modality, which includes possibility, existence, necessity. These indicate the elements of our knowledge *a priori;* it being the opinion of the author, that such notions, as causation, necessity, etc., cannot be obtained from the exercise of our senses and intelligence upon the world of realities, but must have been somehow or other imprinted upon the mind originally. See ANTINOMY; KANT.

CA'TEL, FRANZ, 1778–1856; a German artist who first gained reputation by his illustrations of Goethe's *Hermann and Dorothea*. He labored in Paris and Rome, and his works found their way all over the continent. He left all his fortune for the benefit of poor artists.

CAT'ENARY. The C. is the curve formed by a flexible homogeneous cord hanging freely between two points of support, and acted on by no other force than gravity. If the cord is not homogeneous, and the density varies in any regular way, the cord hangs in a curve slightly different in shape from that of the ordinary catenary. The C. possesses several remarkable properties, one of which is, that its center of gravity (q.v.) is lower than that of any curve of equal perimeter, and with the same fixed points for its extremities. Where the cord is such that the weight of any part of it is proportioned to its horizontal projection, the curve is a parabola (q.v.). The latter curve and the ordinary C. are of importance chiefly in the theory of suspension bridges (q.v.). The properties of the C. will be found fully analyzed in all the leading works on mechanics.

CATENIPORA, a genus of fossil lamelliferous corals peculiar to paleozoic strata, confined in Britain to the Silurian measures. The genus is easily recognized. The cells are terminal and oval, arranged like a loose net-work of chains, hence called "chain coral." Vertical anastomosing lamellæ united the cells together, and formed a hemispherical polypidom, sometimes of great size.

CATE'RINA, SANTA, a t. of Sicily, in the province of Caltanisetta, and 7. m. n.n.w. of the town of that name. It is situated on a hill near the river Salso, is fortified, has manufactures of fine earthenware; and in the neighborhood are found jaspers and agates of good quality. Pop. 5,800.

CATERPILLAR, the name given to the larvæ of lepidopterous insects—butterflies, moths, and hawk-moths. Caterpillars exhibit as great differences as subsist among the perfect insects into which they change, and the family, genus, and species may be determined by the characters of the C., as well as of the perfect insect. Their body is generally long, nearly cylindrical, soft, and consisting of 12 rings or segments besides the head, with nine spiracles or small openings for respiration on each side. The head is much harder than the rest of the body, of a sort of almost horny substance, and has 6 small shining points on each side, which are regarded as simple or *stemmatic* eyes, and is also furnished with two very short rudimentary antennæ. The mouth is adapted for tearing, cutting, and masticating the substances on which the C. is destined to feed, which are very various in the different species, although in all extremely different from the food of the perfect insect; it is provided with two strong *mandibles*, or upper jaws: two *maxillæ*, or lower jaws; a *labium*, or lower lip; and four *palpi*, or feelers. In the mouth also is situated the *spineret* of those species which, when they change into the chrysalis or pupa state, envelop themselves in silken cocoons. See SILK-WORM. The first three segments of the body are each furnished with a pair of feet, which are hard and scaly, and represent the 6 feet of the perfect insect; some of the remaining segments are also furnished with feet, varying in all from 4 to 10 in number, the last pair situated at the posterior extremity of the body; but these feet are soft and membranous or fleshy, and armed at their extremity with a sort of circlet of minute hooks. All the feet or legs are very short. Those caterpillars in which the *pro-legs*, as they are sometimes called, or supplementary soft feet, are pretty equally distributed along the body, move by a sort of regular crawling motion; but those which have only four such feet situated near the posterior extremity, move by alternately taking hold by what may be called their fore-feet and their hind-feet, now stretching the body out to its full length, and now bending it into an arch, whilst the hinder part is brought forward almost into contact with the forepart. Caterpillars which move in this way are called *geometers* or *loopers*. Some caterpillars have the power of fixing themselves by the two hind feet to a twig, and stretching themselves out as straight as a rod, so that being in color very like a twig of the tree on the leaves of which they feed, they are not readily observed. The muscular power required for this position of rest is very great, and Lyonnet found the number of muscles in a C. to be more than 4,000. The skin of some caterpillars is naked, that of others is covered with hairs, spines, or tubercles. Some make for themselves nests or tents of silk, under which they dwell in societies, protected from the inclemency of the weather. Many construct cases or sheaths by agglutinating various substances together, as the C. of the common clothes-moth. Some roll together leaves, and fix them by threads,, so forming a dwelling for themselves; and a few burrow and excavate galleries in the substance of leaves. Many feed on leaves; many being limited to a particular kind of plant, or to a few nearly allied plants. Some feed on flowers, some on seeds, some on roots, and some even on the woody portions of stems; some on wool, hides, furs, and other animal substances; a few on lard, and other kinds of fat. Among the admirable arrangements which make all nature harmonious, is the adjustment of the time of each kind of C.'s appearance to that of the leaf or flower on which it is to feed.

CATERPILLAR FUNGUS, or FUNGOID PARASITES, a species of fungus that attacks insects, particularly the larvæ of moths and beetles, filling their bodies and sending shoots beyond the skin so that the creature takes the appearance of a vegetable growth. These growths vary in length from a slight projection to nearly a foot, and in diameter from a hair to a quarter of an inch. The fungi attacking insects also infest all organic and decaying matter.

CATES'BY, MARK, 1680–1749; an English naturalist who was seven years in the American colonies, returning to England in 1719 with a fine collection of plants. He

made another journey in 1722, exploring South Carolina, Georgia, Florida, and the Bahamas. He published *Natural History of Carolina, Florida, and the Bahama Islands,* in which the figures were etched by himself from his own paintings. He also wrote *Hortus Europeæ Americanus* and a paper on *Birds of Passage.*

CAT-FISH, a name given to several species of the family *Siluridæ,* dwelling in American rivers and lakes. The common cat-fish, or horned pout, of the Atlantic slope, is preferred above most river fish for food. They are from 7 to 9 in. long, dusky brown in color on the back and sides, and white underneath. The upper jaw is the longest; the tail is rounded; skin without scales and commonly covered with a slimy secretion. It has two fleshy barbels (long beard-like spines) on the top of the nose, and others at the angles of the jaws. Its mouth is very large. Immense cat-fish are found in the great lakes and western rivers, more than 4 ft. long and weighing 60 to 150 lbs.

CATGUT is employed in the fabrication of the strings of violins, harps, guitars, and other musical instruments; as also in the cords used by clockmakers, in the bows of archers, and in whip-cord. It is generally prepared from the intestines of the sheep, rarely from those of the horse, ass, or mule, and *not* those of the cat. The first stage in the operation is the thorough cleansing of the intestines from adherent feculent and fatty matters; after which they are steeped in water for several days, so as to loosen the external membrane, which can then be removed by scraping with a blunt knife. The material which is thus scraped off is employed for the cords of battle-doors and rackets, and also as thread in sewing the ends of intestines together. The scraped intestines are then steeped in water, and scraped again, when the large intestines are cut and placed in tubs with salt, to preserve them for the sausage-maker; and the smaller intestines are steeped in water, thereafter treated with a dilute solution of alkali (4 oz. potash, 4 oz. carbonate of potash, and 3 to 4 gallons of water, with occasionally a little alum), and are lastly drawn through a perforated brass thimble, and assorted into their respective sizes. In order to destroy any adherent animal matter, which would lead to putrefaction and the consequent development of offensive odors, it is customary to subject the C. to the fumes of burning sulphur—sulphurous acid, which acts as an antiseptic (q.v.), and arrests decomposition. The best strings are used for musical instruments; and those which come from Italy, and are known as *Roman strings,* are the strongest. They are remarkable for their clearness and transparency. Cord for clockmakers is made from the smallest of the intestines, and occasionally from larger ones, which have been split longitudinally into several lengths. Whip-cord is fabricated from C. which has been twisted in a manner somewhat similar to single-corded ropes. The C. obtained from the intestines of horses, asses, and mules is principally made in France, and is employed instead of leather-belts for driving machinery.

CA'THA, a genus of the natural order *celastraceæ.* The fruit is a three-cornered capsule.—*C. edulis,* sometimes called Arabian Tea, the Khât of the Arabians, is a shrub with erect smooth branches, elliptical obtusely serrated leaves, and small flowers in axillary cymes. It is a native of Arabia, and the Arabs ascribe to its leaves, even carried about the person, extraordinary virtues as a preventive of plague, with probably about as much reason as our forefathers had for esteeming the rowan tree formidable to witches. When fresh, they are stimulant, narcotic, and intoxicating, and are eaten with greediness by the Arabs. They are very antisoporific, so that a man, after using them, may keep watch for a whole night without drowsiness.

CATHARI, or Catharists (Gr. pure), a name very generally given to various sects which appeared in the church during the middle ages. It appears to have been sometimes assumed in profession of a purity of doctrine and morals superior to that which generally prevailed in the church, sometimes bestowed ironically in ridicule of such a profession, and perhaps was first used as a designation of the Paulicians (q.v.). It became a common appellation of sects which appeared in Lombardy in the beginning of the 11th c., and afterwards in France and the w. of Germany. Having some connection with the Bulgarian Paulicians, they were sometimes called *Bulgarians;* sometimes also *Patarenes* or *Patarines,* sometimes *Publicans* or *Popelitans,* and in the Low Countries, *Piphles.* The names *Albigenses* and C. are often used as equivalent to one another; but we are under the disadvantage of having to depend entirely on the writings of very bigoted adversaries for our knowledge of their doctrines and practices, and considerable obscurity rests on all this interesting part of ecclesiastical history. Manicheism, Gnosticism, and Montanism are ascribed to the C.; but there is much reason to think that the errors of a few were often indiscriminately charged upon all, and that such charges indeed sometimes rested on ignorant or willful misconstruction. It appears quite certain, that the C. differed considerably in their doctrines and in the degree of their opposition to the dominant church. Some of them advocated and practiced a rigid asceticism. There is no good evidence that any of them nearly approached to the doctrines of the reformation; although in their rejection of tradition, of the authority of Rome, of the worship of saints and images, etc., there are notable points of agreement with the views of the reformers.

CATH'ARINE is the name of several saints of the Roman Catholic church. The simple designation of *Saint C.,* however, is given to a virgin, said to have been of royal descent

in Alexandria, who, publicly confessing the gospel at a sacrificial feast appointed by the emperor Maximinus, was put to death in 307 A.D., after being tortured on a wheel. Hence the name of "St. Catharine's wheel." Very extraordinary legends exist as to her converting 50 philosophers sent by the emperor to convert her in prison, besides a multitude of other persons; the conveyance of her head by the angels to Mt. Sinai, etc. She is regarded as the patroness of girls' schools.—*Saint C. of Siena*, one of the most famous saints of Italy, was the daughter of a dyer in Siena, and was born there in 1347 A.D.; practiced extraordinary mortifications; and was said to be favored with extraordinary tokens of favor by Christ, whose wounds were impressed upon her body, etc. She became a Dominican, and therefore afterwards a patron saint of the Dominicans. She wrote devotional pieces, letters, and poems, which have been more than once printed: the best edition appeared at Siena and Lucca, in 1707–13, in 4 vols. 4to, under the title of *Opere della serafica Santa Catarina.*—*St. C. of Bologna* and *St. C. of Sweden* are of less note.

CATHARINE I., Empress of Russia, was originally by name Martha Rabe, and was the posthumous daughter of John Rabe, a Swedish quarter-master in Livonia. Her mother died in 1685, when she was but three years old. Left hopeless and destitute, a parish-clerk took compassion on her, and supported her, and a Lutheran clergyman in Marienburg, afterwards received her into his house as an attendant on his children. In 1701, she married a Swedish dragoon, who next year was called to active service; and Marienburg being taken by the Russians, she became for some time the mistress of gen. Bauer; and afterwards entering the service of the princess Menschikoff, she attracted the notice of Peter the great. In 1703, she went over to the Greek church, and took the name of Catharina Alexiewna. After being for some years the emperor's mistress, she was privately married to him in 1711; the marriage was publicly avowed in 1712; she was proclaimed empress in 1718, and was crowned at Moscow in 1724. She bore eight children to the emperor, all of whom died in childhood, except two daughters, Anne and Elizabeth, the latter of whom was afterwards empress of Russia, and the former married the duke of Holstein, and was the mother of the emperor Peter III. When Peter the great and his army seemed entirely in the power of the Turkish army on the Pruth in 1717, C., who was with him, sought an interview with the grand vizier, and, by employing her jewels to bribe his attendants, succeeded in procuring the deliverance of the Russians. Her conduct on this occasion excited so much admiration and gratitude in the emperor, that he resolved to appoint her his successor. Yet in the end of the year 1724, she became the object of his displeasure and suspicion, on account of an alleged intimacy with a chamberlain, whom he caused to be beheaded. Menschikoff, who had always been attached to her interests, was at this time in disgrace. But she had contrived in a great measure to recover her position, when, on 28th Jan., 1725, Peter the great died. His death was kept secret as long as possible, that everything might be arranged for her taking possession of the throne; and the archbishop of Pleskow came forward and declared before the troops and people, that the emperor, on his death-bed, had declared her alone worthy to be his successor. The hostility and hesitation of the nobles were at once overcome, and C. was acknowledged as empress and sole ruler of all the Russias. Under Menschikoff's directions, the affairs of government went on well enough for a time; but the empress ere long began to yield to the influence of a number of favorites, addicted herself to drunkenness, and lived such a life as could not fail to hurry her to the grave. She died, however, unexpectedly, 17th May, 1727.

CATHARINE II., empress of Russia, was b. at Stettin on 25th April, 1729. Her father, the prince of Anhalt-Zerbst, was a Prussian field-marshal, and governor of Stettin. She received the name of Sophia Augusta; but the empress Elizabeth of Russia having selected her for the wife of her nephew and intended successor, Peter, she passed from the Lutheran to the Greek church, and took the name of Catharina Alexiewna. In 1745, her marriage took place. She soon quarreled with her husband, and each of them lived a life of unrestrained vice. Among his attendants was a count Soltikow, with whom her intimacy soon became scandalous; and Soltikow was sent on an embassy abroad. But the young Polish count, Stanislaus Poniatowski, almost immediately supplied his place. After the death of the empress Elizabeth in 1761, Peter III. ascended the Russian throne; but the conjugal difference became continually wider. C. was banished to a separate abode; and the emperor seemed to entertain the design of divorcing her, declaring her only son, Paul, illegitimate, and marrying his mistress, Elizabeth Woronzow. The popular dislike to Peter, however, rapidly increased; and at length, he being dethroned by a conspiracy, C. was made empress. A few days afterwards Peter was murdered (July, 1762). What participation his wife had in his murder, has never been well ascertained.

C. now exerted herself to please the people, and among other things, made a great show of regard for the outward forms of the Greek church, although her principles were, in reality, those of the infidelity then prevalent among the French philosophers. The government of the country was carried on with great energy; and her reign was remarkable for the rapid increase of the extent and power of Russia. Not long after her accession to the throne, her influence secured the election of her former favorite, Stanislaus Poniatowski, to the throne of Poland. In her own empire, however, discontentment

was seriously manifested, the hopes of the disaffected being centered in the young prince Ivan, who was forthwith murdered in the castle of Schlüsselburg. From that time, the internal politics of Russia long consisted in great part of intrigues for the humiliation of one favorite and the exaltation of another. The first partition of Poland in 1772, and the Turkish war, which terminated in the peace of Kainardji in 1774, vastly increased the empire. The Turkish war which terminated in the peace of Jassy in 1792, had similar results, and also the war with Sweden, which terminated in 1790. The second and third partitions of Poland, and the incorporation of Courland with Russia, completed the triumphs of C.'s reign. She began a war with Persia, however, and cherished a scheme for the overthrow of the British power in India; but a stroke of apoplexy cut her off on Nov. 9, 1796. She was a woman of great ability; but, utterly devoid of principle, she shrunk from no crime; and sensuality and ambition governed all her actions. She was shameless in vice; and always had a paromour, who dwelt in her palace, and might be regarded as filling an acknowledged office of state, with large revenues and determinate privileges. Yet distinguished authors flattered her; and she invited to her court some of the literati and philosophers of France. She was ever ready to commence great undertakings, but most of them were left unfinished; and little was really accomplished in her reign for the improvement of the country, or the progress of civilization. On a visit to the southern provinces of the empire in 1787, she was gratified by a perpetual display of fictitious wealth and prosperity along the whole route. This imperial progress was also a triumphal procession of her vile favorite Potemkin (q.v.).

CATHARINE OF ARAGON, Queen of England, the first wife of Henry VIII., and fourth daughter of Ferdinand and Isabella, king and queen of Castile and Aragon, was b. Dec., 1485. She occupies a prominent place in English history, not for what she herself was, but for what she was the occasion of—the reformation. Married when scarcely 16, to Arthur, prince of Wales, son of Henry VII., she was left a widow within a year; and in the course of a few months more a second marriage was projected for her by her father-in-law, with his second son Henry, as yet a boy of only 12 years old. The pope's dispensation enabling such near relatives to marry was obtained in 1503, and the marriage took place in June, 1509, immediately after Henry's accession to the crown as Henry VIII. Although Henry was very far from being a model husband, he appears to have treated queen C., who had borne him several children, with all due respect, until about 1527, when he conceived a passion for Anne Boleyn (q.v.). He now expressed doubts as to the legality of his marriage, and set about obtaining a divorce. Pope Clement VII. would readily have annulled the marriage permitted by his predecessor, had he not feared queen C.'s powerful nephew, the emperor Charles V. He, however, granted a commission to Compeggio and Wolsey, to inquire into the validity of the marriage; but before these prelates queen C. refused to plead, adn appealed to the pope. The king craved judgment. The legates cited the queen, and declaring her contumacious when she appeared not, went on with the cause; but the wily Campeggio, anxious only for time for his master when the king expected an answer, prorogued the court until a future day. The king consulted the universities of Europe, many of which declared the marriage invalid. The pope now summoned the king to Rome, but Henry haughtily refused to appear either himself, or by deputy, which he maintained would be to sacrifice the prerogatives of his crown; and setting the pope at defiance, married Anne Boleyn. Cranmer, shortly afterwards (1533), declared the first marriage void, and pope Clement annulled Cranmer's sentence, making the separation from Rome complete. Queen C. did not quit the kingdom, but took up her residence first at Ampthill, in Bedfordshire, and aftewards at Kimbolton castle, Huntingdonshire, where she led an austere religious life until her decease in Jan., 1536. Queen C.'s personal character was unimpeachable, and her disposition sweet and gentle.

CATHARINE DE' MEDICI, the queen of Henri II. of France, was the daughter of Lorenzo de' Medici, duke of Urbino, and was b. at Florence in 1519. In her 14th year she was brought to France, and married to Henri, the second son of Francis I. The marriage was a part of the political schemes of her uncle, pope Clement VII., but as he died soon after, she found herself friendless and neglected at the French court. In these circumstances, she conducted herself with a submission which seemed even to indicate a want of proper spirit, but which gained her the favor of the old king, and in some measure also of her husband. It was not till the accession of her eldest son, Francis II., in 1559, that her love of power began to display itself. The Guises at this time possessed a power which seemed dangerous to that of the throne, and C. entered into a secret alliance with the Huguenots to oppose them. On the death of Francis II. in 1560, and accession of Charles IX., the government fell entirely into her hands. Caring little for religion in itself, although she was very prone to superstition, she disliked the Protestants, chiefly because their principles were opposed to the absolute despotism which she desired to maintain. Yet she sought to rally the Protestant leaders around the throne, in order to remove the Guises. This attempt having failed, and the civil war which ensued having ended in the peace of Amboise, highly favorable to the Protestants, she became alarmed at the increase of their power, and entered into a secret treaty with Spain for the extirpation of heretics; and subsequently into a plot

with the Guises, in which at first only the murder of the Protestant leaders was contemplated, but which resulted in the fearful massacre of St. Bartholomew's day. This event brought the whole power of the state into the hands of the queen-mother, who boasted of the deed to Roman Catholic governments, and excused it to Protestant ones, for she now managed all the correspondence of the court. About this time she succeeded, by gold and intrigues, in getting her third son, afterwards Henri III., elected to the Polish throne. But her arbitrary and tyrannical administration roused the opposition of a Roman Catholic party, at the head of whom was her own fourth son, the duke of Alençon, who allied themselves with the Protestants. It was very generally believed that she was privy to the machinations that led to his death. When, after the death of Charles IX., Henri III. returned from Poland to be king of France, his mother still ruled the court, and had the principal share in all the intrigues, treacheries, and political transactions of that woful period. Having betrayed all who trusted them, she and her son found themselves at last forsaken and abhorred by all. The league and the Guises had no more confidence in them, than had the Protestants and Henri of Navarre. Vexation on this account prayed on the proud heart of the queen-mother in her last days; and, amidst the confusion and strife of parties, she died at Blois, on 5th Jan., 1589, unheeded and unlamented. Her ruling passion was ambition, and to this she was ready to sacrifice everything. Her unprincipled policy had almost subverted the French monarchy; her extravagance and luxury exhausted the finances of the country. Her influence was powerful in increasing the demoralization of the court and of society. She unscrupulously employed beauties of her train to corrupt men from whose power she apprehended danger.

CATHARINE PARR, the sixth wife of Henry VIII., was the daughter of sir Thomas Parr, and was b. in 1513. Married first to lord Burgh, and afterwards to lord Latimer, she, in July 12, 1543, became queen of England by marriage with Henry VIII. She was distinguished for her learning and her knowledge of religious subjects, her discussion of which with the king had well-nigh brought her to the block, like so many of her predeccssors. Her tact, however, saved her, and brought rebuke on her enemies; for she made it appear to the king's vanity, that she had only engaged him in discourse about the reformation, in order to derive profit from his majesty's speech. She persuaded Henry to restore the right of succession to his daughters, and interested herself on behalf of the universities. After Henry's death, she married, 1547, sir Thomas Seymour, and died the following year, not without suspicion of poison.

CATHARINE'S, ST., COLLEGE, or HALL, Cambridge, was founded by Robert Wodelarke, provost of King's college, 1473, for a master and three or more fellows. The visitors sent down to the university by Edward VI. ordered that there should be then six fellows, and in future a greater or less number as the revenues permitted. The statutes confirmed in May, 1860, provide that there shall be a master and nine fellows. There are twenty-five scholars. Edwyn Sandys, archbishop of York, bishop Overall, and bishop Sherlock, were of this college.

CATHAR'TES AURA, a vulture known as the turkey-buzzard, from its resemblance to the domestic turkey. Its home is in the southern Atlantic and gulf states, though it is sometimes found in the West Indies. The full-grown bird is 30 in. long, with a spread of wings of 6 ft., and the color black and brown. This greedy bird acts as the scavenger for southern cities, devouring refuse matter that might otherwise be injurious to the public health. For this purpose they are deemed so valuable that in some places their destruction is forbidden. There is a small species known locally as the carrion-crow.

CATHARTICS (Gr. *kathairō*, I purify), a name originally for all medicines supposed to purify the system from the matter of disease (*materies morbi*), which was generally presumed by the ancients to exist in all cases of fever and acute disease (see CRISIS), and to require to be separated or thrown off by the different excretions of the body. Ultimately, the term C. became limited in its signification to remedies acting on the bowels, which are popularly called *purgatives*—a mere translation of the Greek word. The principal C. are aloes, gamboge, colocynth, rhubarb, scammony, jalap, senna, Epsom, and other salts, and castor oil. Sulphur and cream of tartar forms a well-known mild laxative; magnesia is also useful in many cases of indigestion with acidity. Croton oil and elaterium belong to a more dangerous class of C., as also does the favorite remedy of the ancients—the black hellebore. The doses and use of the more ordinary remedies of this class are explained in all works on medicine. See CONSTIPATION.

CATHARTINE, or BITTER OF SENNA, is the essential principle in senna which possesses laxative or purgative properties. It can be isolated as a yellowish-red uncrystallizable solid, which is deliquescent, soluble in water and alcohol, insoluble in ether, has a very bitter nauseous taste, a characteristic odor, and possesses great purging powers, accompanied by nausea and griping. Three grains of C. are a full dose.

CATHAY. See CHINA, *ante*.

CATHCART, Sir GEORGE, son of William, Earl Cathcart, was b. in London, 1794. Educated at Eton and Edinburgh, he, in 1810, joined the 2d life guards, and fought with the grand army in the campaigns of 1812 and 1813; and as aid-de-camp to the duke of Wellington, was present at Quartre Bras and Waterloo. In 1828, he was made lieut.

col., and served in British America and the West Indies for about 8 years; and in 1837 he proved himself an energetic and efficient officer in quelling the outbreak in Canada, where he remained for more than 6 years. In 1852, having held the appointment of deputy lieut. of the tower for some years, he was made governor of the cape of Good Hope, with command of the forces, and in this capacity succeeded in bringing to a successful end the harassing Kaffer war. He returned to England in time to be sent out to the Crimea as general of division. His bravery here was conspicuous, especially in the battle of Inkermann, where the odds were so terribly against the British forces, and where he was slain. He was buried on the spot where he fell, and which, in his honor, was named Cathcart's hill. C. was the author of a very valuable work, entitled *Commentaries on the War in Russia and Germany in* 1812 *and* 1813 (Lond. 1850).

CATHCART, William Shaw, Earl, a British gen. and diplomatist, son of baron Cathcart of Cathcart, co. of Renfrew, was b. Sept. 17, 1755. Having studied at Glasgow, he entered the army, took a prominent part in the American war, and fought with distinction in Flanders and n. Germany. In 1801, he was made lieut.gen., and in 1803, commander-in-chief for Ireland. In 1805, he was engaged on a diplomatic mission to the czar Alexander. In July, 1807, he received the command of the land forces employed to co-operate with the fleet in the attack on Copenhagen, and, for his services in this capacity, was made a British peer, with the title of viscount, and received a vote of thanks from both houses of parliament, Jan. 28, 1808. In 1812, he was sent as ambassador to St. Petersburg, accompanied the czar Alexander in the campaigns of 1813 and 1814, and was present at the congresses of Chatillon and Vienna. He was raised to the rank of earl, June 18, 1814. The latter years of his life were chiefly spent at his country residence, Cartside, near Glasgow, where he died June 17, 1843.—His eldest son, Charles Murray, Earl Cathcart (formerly known as lord Greenock), was born 1783; served in Spain and at Waterloo under Wellington; afterwards acted in Canada; and was made a general and colonel of the 1st dragoon guards. He died July, 1859.

CATHE'DRAL, from a Greek word *cathedra,* signifying a *seat.* Thus, "to speak *ex cathedrâ,*" is to speak as from a *seat* of authority. The C. city is the seat of the bishop of the diocese, and his throne is placed in the C. church, which is the parish church of the whole diocese. The diocese was, in fact, anciently called *parochia,* until the application of this name to the smaller portions into which it was derived. A C. town has generally been understood to be entitled to the honors of a city, even although the town be not a borough incorporate; but in the case of Manchester, the claim was disallowed by a court of law. The distinction between C. and collegiate churches consists principally in the see of the bishop being at the former. The governing body of a C. is called the dean and chapter—i.e., the dean and canons who meet for corporate purposes in the chapter-house of the cathedral. The property of the C. vests in this body. They elect the bishop of the diocese on the issue of a *congé d'élire* from the crown, but as the person to be elected is always named, and they may be compelled by a mandamus to elect that person and no other, the election is merely a form.

The bishop is "visitor" of the dean and chapter. In England, by the act of 1840, all members of cathedrals, except the dean, are styled canons. Their *seat* in the C. is called their *stall.* They are no longer called prebends. Canons must reside 3 months in each year. The act allows to the canons of Durham, Manchester, St. Paul's, and Westminster, an income of £1000 per annum; to those of every other C. in England, £500. The bishop was always considered of common right to have the patronage of canonries, but formerly there were exceptions. Now, the appointment to all canonries is vested either in the bishop, or in the crown. Where the bishop is patron, he "collates," and the dean and chapter "induct," by placing the new canon in a stall in the church. The crown appoints by letters-patent, and the canon is installed without collation. Honorary canons have no emoluments, but rank after the canons. Minor canons, of whom there are from 2 to 6 in each C., perform the daily choral services. The C. service is the usual church of England service intoned, with an anthem and the Psalms chanted. For the general plan of C. buildings, see Church. The more remarkable cathedrals will be noticed under the names of the towns in which they are situated. In England, the number of cathedrals is 29.

CATHEDRAL (*ante*). As Christianity was at first established chiefly in cities, the churches that grew up adjacent to them were, either originally or eventually, included in the diocese of the city bishop. Throughout the Roman empire the ecclesiastical divisions were the same as the civil, and the bishop's seat was placed in the same city with the governor's chair of state. From this point the transition was easy to the formal decree requiring that a C. as the seat of a bishop should be established in cities only. In Britain, however, where in the early days of Christianity cities were few and small, this rule could not be enforced. The bishop was over a district or tribe rather than a city, and naturally placed his seat where he found it most convenient and safe. Often he was compelled to remove it from one place to another. As the country became more settled this necessity ceased to exist, and at the close of the 11th century a law was passed requiring that the sees of bishops should be removed from villages to walled cities. In the early missionary work, especially of Britain, instead of beginning with a bishop,

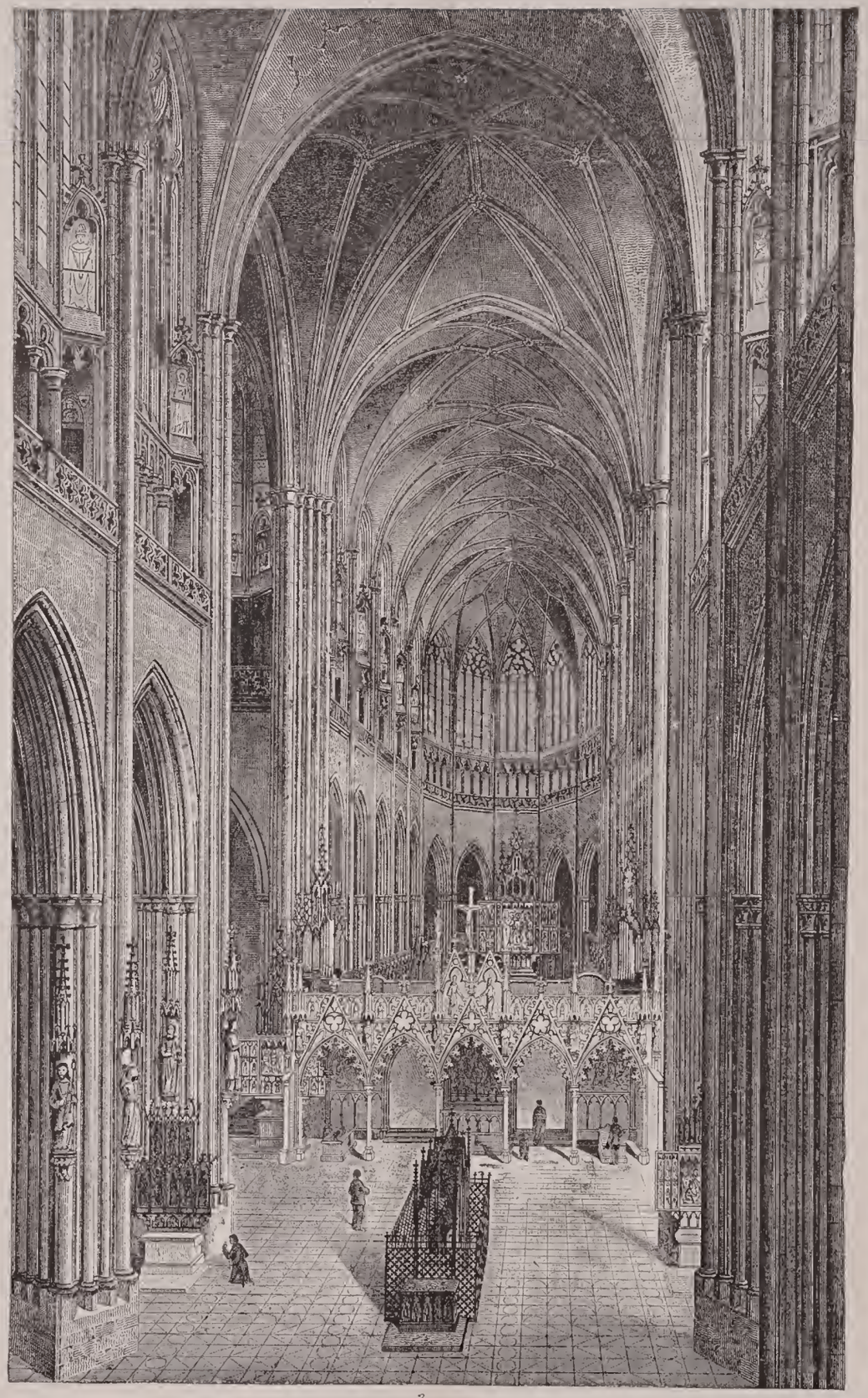
companies of priests were organized, with the church as their center of work and the monastery as their home. After sufficient progress had been made, a bishop was appointed over them, and the church became a cathedral. The revival of missionary work by the church of England, at the beginning of the present century, led to a renewal of this system. The bishop followed the missionaries, and placed his seat in a church not originally designed for the honor. In colonial and foreign missionary work, within the last 25 years, there has been a return to the earlier plan. In the dioceses of Africa, New Zealand, and elsewhere, the bishop takes the lead in the date of his appointment as well as in rank, and his cathedral church is at once erected and manned. In this way the original design of such an establishment as described by bishop Stillingfleet is accomplished. "Every C., in its first institution, was as a temple to the whole diocese, where the worship was to be performed in the most decent and constant manner; for which end it was necessary to have such a number of ecclesiastical persons there attending as might still be ready to do all the offices which did belong to the Christian church—such as constant offering of prayer, singing, preaching, and administering sacraments—which were to be kept up in such a church as the daily sacrifice was in the temple." The bishop in his church was surrounded by his college of presbyters, of which he was the head, and the design of which was: 1. To strengthen him by wise counsel. 2. To maintain public worship with reverence and dignity. 3. To go forth at his command, as evangelists, whithersoever he might send them. In this way the chapter of the C. was established, originally in closest connection with the bishop, and having no corporate existence separate from him. It sometimes consisted of "secular clergy," who were not bound by monastic vows, and had separate homes of their own; and sometimes of "regulars," who were under monastic rule and lived in buildings common to all. Of both kinds of chapters the bishop was the head: of the latter, as the abbot of the monastery to which his cathedral church belonged; and of the former, as having sole authority over it. In early times, there was an arch-presbyter, who had chief authority among the cathedral clergy, always in strict subordination to the bishop. He was gradually supplanted by the archdeacon, who was followed in the 8th and 9th centuries by the "præpositus" or provost. The "dean," the present head of all English cathedral chapters, first appears in the 10th or 11th century. Gradually, as the bishop's diocesan duties increased and important political functions also were assigned him, he was obliged to leave the affairs of his C. to the head of the chapter, who consequently, in time, became the actual chief; and when the chapter was organized as an independent corporation, the bishop, seldom present, sank into a mere "visitor," called in occasionally to correct abuses or settle disputes. This is the explanation of the strange anomaly, witnessed in modern times, that in his own cathedral church, of which he is the titular head, and which is dignified by the presence of his seat, the bishop has less authority than in any other church of his diocese. Under the bishop as its *nominal* head, the chapter of a fully organized C., formed of secular priests, consisted of four chief dignitaries and a body of canons. I. The four high officers were: 1, the "dean," as the general head of the chapter charged with its internal discipline; 2, the precentor, presiding over the choir and musical arrangements; 3, the chancellor, who superintended the religious and literary instruction of the younger members, took care of the library, and wrote the letters; 4, the treasurer, to whom were intrusted, not the money of the church (as might appear from the modern use of the word), but its sacred vessels, altar-furniture, reliquaries, and similar treasures. II. In addition to these dignitaries, a cathedral chapter consisted of a board of officers called canons, because they were inrolled on the *list* and perhaps because they were subjected to the *rules;* some of them who enjoyed a separate estate (præbenda) in addition to their share of the corporate funds, were called prebendaries. A prebendary was always a canon, but a canon was not always a prebendary. Each canon had his own house and personal establishment. In the middle ages an attempt was made to impose on them, in part, monastic rules with dining-hall and lodging-rooms in common; but the restriction was never acceptable, and was gradually given up. Monastic cathedrals closely resembled other monasteries, except that in the almost constant absence of the bishop—their nominal abbot—they were governed by a prior. At the reformation the distinction between secular and monastic cathedrals was maintained under the titles of cathedrals of the old and new foundations. And when the monasteries were suppressed, the cathedrals connected with them were furnished with new chapters of secular canons, presided over by a dean. In the early part of queen Victoria's reign all the cathedrals in England and Wales were reduced to a uniform constitution.

In the Protestant Episcopal church in the United States, there is in recent years an evident movement in some dioceses toward the establishment of the cathedral system of England, with such modifications as the circumstances may require. For the diocese of Long island, noble structures have risen or are in process at Garden City, including schools of various grades, and institutions of beneficence, grouped around a magnificent cathedral church. The funds for this great work are from the estate of the late Alexander T. Stewart, of New York.

CATHELINEAU, Jacques, general of the army in La Vendée, in the w. of France, was b. Jan. 5, 1759, in very humble life, at Pin-en-Mauges, in lower Anjou. Horrified at the atrocities and despotic acts of the convention, he placed himself in opposition to



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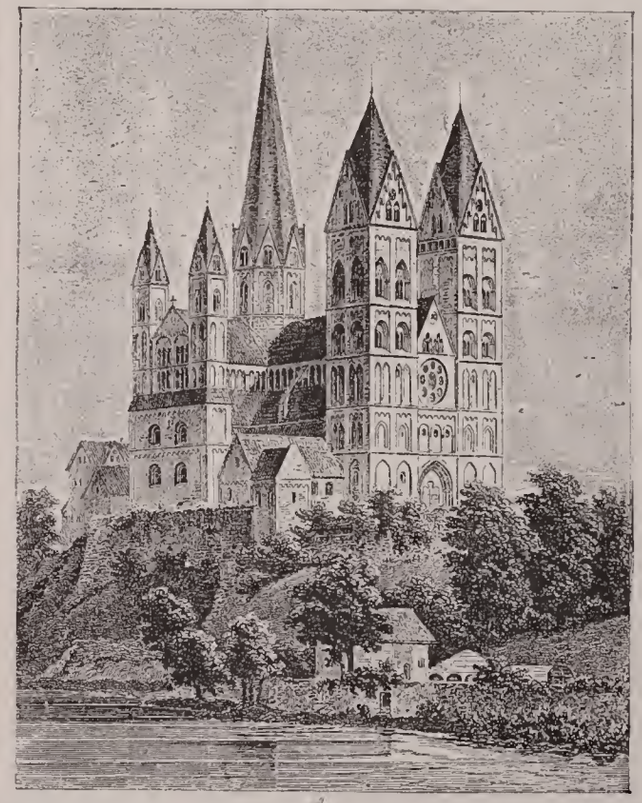
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CATHEDRALS.—1. Cathedral at Worms. 2. Cathedral at Lichfield. 3. Interior of Cathedral at Prague. 4. Cathedral at Limburg on the Lahn. 5. Chapel of Henry VIII. at Westminster.

it, and soon collected around him a body of loyal peasantry, whom he led against and defeated the republicans in several conflicts. After the victory of Saumur (q.v.), the council of generals appointed him, as having the greatest influence over his countrymen, commander-in-chief. He immediately determined to make an attack upon Nantes, and managed to penetrate into the town, where he was wounded by a musket-ball, and his troops immediately dispersed. He was carried to St. Florent, where he died July 11, 1793. He was a man of great simplicity and honesty of character, and his piety was such, that he was called the saint of Anjou.

CATHERINE OF BRAGANZA, 1638–1705; queen of Charles II. of England, daughter of John, duke of Braganza, the rightful heir to the throne of Portugal, then under Spanish rule. John headed the revolt of 1640, and after years of fighting succeeded in reaching his throne. The mother of Catherine was a woman of ability, and governed Portugal for several years after the death of her husband. She foresaw the coming restoration in England, and proposed the marriage of Catherine with Charles mainly to gain a powerful ally against Spain. The latter power vainly tried to prevent the marriage, and when it was agreed upon, Portugal promised a dowry of £500,000, and the towns of Tangier and Bombay (the latter being the first of the now enormous English possessions in the east), besides many privileges of trade. On the marriage at Plymouth, May 13, 1663, Charles appeared to be well pleased with his bride; but the union proved unhappy. Catherine had been brought up in a convent, and had none of the manners required by the most fashionable and profligate court of Europe. The chief trouble, however, was the heartless and shameless profligacy of her husband, who brought his mistresses into the court, and, when the queen expressed her indignation at the insult, lectured her upon the duty of submission. After repeated humiliations of this kind, the queen's spirit was broken, and alienation naturally followed. As she was a Roman Catholic, she was an object of suspicion outside of the court, and her name was subjected to calumny. The only satisfaction she could experience in her unfortunate connection was the great aid rendered by England against Spain in the struggle of her native power with that kingdom. After a life of entire seclusion during the reign of James II. and the first years of William III., she returned to Portugal in 1692, where, for a time before her death, she acted in capacity of regent to her brother, Don Pedro. She had no children.

CATHERINE FIESCHI ADORNO, Saint, 1447–1510; a daughter of the viceroy of Naples, who, at the age of 13, devoted herself to a religious life, but three years later, in obedience to parental desire, married Julian Adorno, a gay young nobleman of Genoa —a reckless fellow, who spent her fortune and gave her a life of misery for many years. After his death she became mother-superior in the hospital, and extended her care to the sick throughout the city. She wrote several works, two of which, *Purgatory*, and *Dialogue Between the Soul and the Body*, are evidently records of her own experience. She was canonized in 1737. In her, a piety contemplative, mystical, and almost ecstatic, had an accompaniment not always found of active beneficence.

CATHERINE OF VALOIS, or of France, 1401–37; Queen of Henry V. of England. She was unfortunate in her childhood, her father, Charles VI. of France, being subject to prolonged fits of insanity, while her mother—who was one of the most abandoned women of the time—neglected her children to such an extent that they were often without suitable food or clothing. She was at last taken away from her mother and educated in a convent. When she was only 12 years old, Henry asked her hand in marriage, coupling the proposal with a demand for a large dowry in money, and the restitution to England of the French provinces once held by the English crown. The proposition was indignantly rejected, and Henry soon afterwards invaded France and asserted his claims in a manner that was not to be resisted. All his claims were admitted, and when he married Catherine at Troyes in 1420 he received immediate possession of the provinces claimed, the regency of France during the life of the father-in-law, and the reversion of the sovereignty after the death of Charles. In 1421, Catherine was crowned at London, and in Dec. of that year she became the mother of Henry VI. The next year she was in France, where her husband died, and she returned to London with the funeral cortége; but after the funeral little is heard of her history, the only notable event being her secret marriage to Owen Tudor, the heir of a princely house in Wales, who had distinguished himself for bravery at Agincourt. His position in England, however, was low, and the marriage was long kept secret—a necessity that caused Catherine much vexation and probably hastened her death. Her son by Tudor was made earl of Richmond, and married Margaret Beaufort, heiress of the house of Somerset, and junior representative of the branch of John of Gaunt, and she became the mother of Henry VII., and consequently the ancestress of the Tudor line of English kings.

CATHERINE-WHEEL (see Catharine, St.) is frequently used as a charge in coats of arms, when it is represented with teeth.

CATHETER (Gr. *kathiemi*, to thrust into), was a name applied indifferently to all instruments used for passing along mucous canals. In modern times, however, it has generally been reserved for tubular rods through which fluids or air may pass, and which may give free exit to the accumulated contents of such organs as the urinary bladder. The

C. for the latter purpose is a very old surgical instrument. The ancients made theirs of copper, which accumulated verdigris. In the 9th c. silver was substituted by the Arabian surgeons as a cleanlier metal, and is still used by all who are not obliged, for economical reasons, to have their catheters made of German silver or pewter. The urinary C. for the male varies in length from 10 to 11 in.; the female C. need not be more than 4 or 5 inches. The form is a matter of indifference, but most surgeons prefer an instrument straight to within the last few inches of its length; the latter should be curved into the segment of a small circle. Others, however, use a double curve, and, indeed, nearly every surgeon has a peculiar fancy in this respect.

Flexible catheters are made of gum elastic, which may be used either alone or supported on a wire. Many other materials have been proposed. Of late years, gutta-percha has been used, but owing to some awkward accidents—such as portions often breaking off in the bladder—it has not been generally adopted by surgeons.

CATHODE. See ANODE.

CATHOLIC APOSTOLIC CHURCH. See IRVINGITES, *ante.*

CATHOLIC CHURCH. The term catholic literally signifies *universal.* The phrase C. C. is therefore equivalent to "universal church," and cannot properly be applied to any particular sect or body, such as the Roman, Anglican, Genevan, Reformed Lutheran, or Presbyterian, all of which form merely portions more or less pure of the "church universal." It was first employed to distinguish the Christian church from the Jewish; the latter being restricted to a single nation, whereas the former was intended for the world in general. Afterwards, it served to mark the difference between the orthodox Christian church and the various sects which sprang from it, such as the Cerinthians, Basilidians, Arians, Macedonians, etc. The name has been retained by the church of Rome, which was the visible successor of the primitive one; and although Protestant divines have been careful to deny its applicability to a church which they consider buried under the corrupt accretions of centuries, yet the term catholic is still used by the populace of almost every Protestant country as synonymous with Roman Catholic, so that from their minds all conception of the literal meaning of the word has vanished. For an account of the church of Rome, see art. ROMAN CATHOLIC CHURCH.

CATHOLIC, or UNITED, COPTS, a body of about 10,000 native Egyptians who acknowledge the authority of the pope of Rome. In 1855, one of their priests was appointed vicar apostolic and bishop *in partibus.*

CATHOLIC CREDITOR, in the law of Scotland, is one whose debt is secured over several or the whole subjects belonging to the debtor—e.g., over two or more heritable estates for the same debt. The C. C. is bound so to exercise his right as not unnecessarily to injure the securities of the other creditors. Thus, if he draw his whole debt from one of the subjects, he must assign his security over the others to the postponed creditors.

CATHOLIC (ROMAN) **EMANCIPATION ACT** (10 Geo. IV. c. 7). To render this famous measure intelligible, and still more to convey a conception of its importance to younger readers, it is necessary that we should preface our account of it by a slight sketch of the position of our Roman Catholic fellow-subjects before it was passed. From first to last, the sufferings of the Roman Catholics were the fruit of political tyranny quite as much as of religious rancour or fanaticism, and their release was effected by a change in the political rather than in the religious views or feelings of the dominant party. The first occasion on which even a promise of a different line of policy from that which had been originally adopted was held out to the Roman Catholics of Ireland, was on the termination of the revolutionary war in 1691; and had king William been able to carry out the views which his personal enlightenment and liberality dictated, it is probable that Catholic emancipation would have been hastened by more than a century. But the English parliament, which was intensely anti-Roman Catholic, enacted, on the 22d of Oct. 1691, that Irish members of both houses should take the oaths of supremacy; and three years later, a set of acts were passed, which placed the Roman Catholics in a worse position than at any previous period of their history. The whole population was disarmed, and the priests banished from the country. But what must have been still more intolerable, was the interference with the private arrangements of their families. All Roman Catholics were prohibited from acting as guardians not only to Protestant but to Catholic children. At a somewhat later date (1704), it was enacted that if a son chose to turn Protestant, he should be entitled to dispossess his father, and at once to take possession of the family estate. Though Catholics were not directly declared incapable of holding land, they were deprived of the right of acquiring it by purchase, or even by long lease; and if a Catholic chanced to occupy a place in a line of entail, he was passed over in favor of the next Protestant heir. No office of trust, civil or military, was now open to a Catholic; he was forbidden to vote at elections, to intermarry with a Protestant, or even to dwell in Limerick or Galway, except under certain conditions. But perhaps the most demoralizing provision of all, was that which empowered the son of a Catholic to bring his father into chancery, to force him to declare on oath the value of his property, and to settle such an allowance on him as the court should determine, not only for the father's life, but the son's.

Amongst the other burdens of this heavy time, may be mentioned the exclusion of Catholics from the profession of the law, and the regulation that if a Protestant lawyer married a Catholic, he should be held to have gone over to her faith: the prohibition against Catholics acting as schoolmasters, under the penalty of being prosecuted as convicts, by which the whole body was virtually excluded from the benefits of education: and the still more summary enactment, that if a priest celebrated marriage between a Protestant and a Catholic, he should be hanged. But as years passed away, the memory of the foul deeds of the inquisition and the confessional, and of the other enormities of which Roman Catholics had been guilty in their days of power, waxed fainter; milder feelings began to prevail; and when Grattan appeared as the champion of their rights, the field was already in some degree prepared for his labors. Favored by such influences, of which no one knew better how to avail himself, he succeeded, in 1780, in carrying, in the Irish parliament, the famous resolution, "that the king's most excellent majesty, and the lords and commons of Ireland, are the only competent power to make laws to bind Ireland." Many of the disqualifying statutes were now repealed, and the claim for complete equality with Englishmen and Protestants, or complete separation from the sister-country, was now formally urged. From this period to the final liberation was achieved, there was no rest. The Irish rebellion of 1798 brought home to the English nation the dangers to which it would constantly be exposed till the question was finally adjusted. The act of union of 1800 was the immediate consequence of that outbreak; and to this act the Irish were induced to consent by a virtual pledge entered into by Mr. Pitt, to the effect that the Catholic disabilities should be at once removed. But, like William of Orange, Pitt had pledged himself to more than he was able to accomplish. The king was seized with scruples regarding the obligations imposed upon him by his coronation oath, and made a vigorous stand against the proposals of his minister.

At a subsequent period, efforts were made in the direction of emancipation by Mr. Canning and lord Castlereagh. About 1824, the press began to take up the question warmly; a Catholic association was formed, to prepare petitions to parliament; the Irish priests stimulated their flocks to subscribe for the purposes of agitation; O'Connell rapidly became a power; and as early as March, 1825, the importance of the question was so deeply felt, that sir F. Burdett ventured to introduce a relief bill, which passed the commons by a majority of 268 to 241, but was rejected by the lords. A slight temporary reaction now took place, the superstitious fears of ignorant Protestants being excited by a "no-popery" cry, and in consequence, a new relief bill, introduced in 1827, though supported by the last effort of Canning's eloquence, was lost in the commons by a majority of 4. But the liberal view of the Roman Catholic claims was essentially the popular one—at least among the enlightened classes; and as a proof of this, under the hostile administration of the duke of Wellington, the very same resolution which had lost in 1827 by a minority of 4, was carried in 1828 by a majority of 6. The duke himself now began to waver in opinion, so that the beginning of the end was manifestly near. During O'Connell's famous canvass for the county of Clare, the duke declared in the house of lords, "if the public mind were now suffered to be tranquil, if the agitators of Ireland would only leave the public mind at rest, the people would become more satisfied, and I certainly think it would then be possible to do something." O'Connell's return for Clare, notwithstanding the existence of the oaths which precluded him from taking his seat in the house, and the events which now followed in quick succession, made it clear that the "something" of which the duke had spoken must be the passing of the emancipation bill in the ensuing session. The king's speech, which was read on the 5th Feb. of the following year, accordingly contained a recommendation to parliament, to consider whether the civil disabilities of the Catholics could not be removed, "consistently with the full and permanent security of our establishments in church and state."

On the 5th Mar., Mr. Peel brought forward the great measure. The majority on the motion in the commons for going into committee was 188, in a house of 508 members· the debate on the second reading issued in a majority of 180; and the final majority, after the bill had passed through committee, in which not one of the many amendments proposed was carried, was 178 in a house of 462. In the lords, the debate lasted three nights, the majority being 106 in favor of the second reading of a bill which, nine months before, the same house had refused, by a majority of 45, even to entertain—so rapid and threatening had been the progress of the agitation. On the 13th April, 1829, this famous measure became the law of the land. It now only remains that, by mentioning the provisions of the act, we sum up the results of one of the most important controversies that ever agitated the inhabitants of this country. For the oath of supremacy, another oath was substituted, by which all Catholic members of parliament bound themselves to support the existing institutions of the state, and not to injure those of the church (see ABJURATION). Catholics were admitted to all corporate offices, and to an equal enjoyment of all municipal rights. The army and navy had already been opened to them. On the other hand, they were excluded from the offices of regent, of chancellor of England or Ireland, and of viceroy of Ireland; from all offices connected with the church, its universities and schools, and from all disposal of church patronage. The most important security related to the franchise, in which a £10 was substituted for a 40*s.* qualification in Ireland. The clergy of the R. C. church were left

in the position of other dissenters, the government having declined either to endow them, or to introduce any machinery for prying into their relations to the pope. But the public use of their insignia of office, and of episcopal titles and names, was denied them; the extension of monachism was prohibited; and it was enacted that the number of Jesuits should not be increased, and that they should henceforth be subject to registration. For further information, see Miss Martineau's *History of England during the Peace from* 1815 *to* 1846. W. & R. Chambers, 1858.

CATHOLIC EPISTLES, the name given, according to Clemens Alexandrinus and Origen, to certain epistles, addressed not to particular churches or individuals, but either to the church universal or to a large and indefinite circle of readers. Originally, the C. E. comprised only the first epistle of John and the first of Peter, but, at least as early as the 4th c. (as evinced by the testimony of Eusebius), the term was applied to all the apostolic writings used as "lessons" in the orthodox Christian churches. But this included the epistle of James, of Jude, the 2d of Peter, and the 2d and 3d of John. These seven thus constituted the C. E., although the genuineness and authenticity of the last-mentioned five were not universally acknowledged; but this very incorporation with epistles whose canonicity was not questioned, naturally had the effect of confirming their authority, so that in a short time the entire seven came to be considered a portion of the canon.

CATHOL'ICOS, the title of the patriarchs or chief ecclesiastics in the hierarchy of the Armenian church, and of the Christians of Georgia and Mingrelia.

CATILI'NA, Lucius Sergius, descended from a patrician but impoverished family, was b. about the year 108 B.C. During his youth, he attached himself to the party of Sulla. His bodily constitution, which was capable of enduring any amount of labor, fatigue, and hardship, allied to a mind which could stoop to every baseness and feared no crime, fitted him to take the lead in the conspiracy which has made his name infamous to all ages. In the year 68 B.C., he was elected prætor; in 67 B.C., governor of Africa; and in 66 B.C., he desired to stand for the consulship, but was disqualified on account of the accusations brought against him of maladministration in his province. Disappointed thus in his ambition, and burdened with many and heavy debts, he saw no hope for himself but in the chances of a political revolution, and therefore entered into a conspiracy, including many other young Roman nobles, in morals and circumstances greatly like himself. The plot, however, was revealed to Cicero by Fulvia, mistress of one of the conspirators. Operations were to commence with the assassination of Cicero in the Campus Martius, but the latter was kept aware of every step of the conspiracy, and contrived to frustrate the whole design. In the night of Nov. 6 (63 B.C.), Catiline assembled his confederates, and explained to them a new plan for assassinating Cicero; for bringing up the Tuscan army (which he had seduced from its allegiance), under Manlius, from the encampment at Fæsulæ; for setting fire to Rome, and putting to death the hostile senators and citizens. In the course of a few hours, everything was made known to Cicero. Accordingly, when the chosen assassins came to the house of the consul, on pretense of a visit, they were immediately repulsed. On the 8th of Nov., Catiline audaciously appeared in the senate, when Cicero—who had received intelligence that the insurrection had already broken out in Etruria—commenced the celebrated invective beginning: *Quousque tandem abutêre, Catilina, patientia nostra?* etc. ("How long now, Catiline, will you abuse our patience?") The scoundrel was abashed, not by the keenness of Cicero's attack, but by the minute knowledge he displayed of the conspiracy. His attempt at a reply was miserable, and was drowned in cries of execration. With curses on his lips, he abruptly left the senate, and escaped from Rome during the night. Catiline and Manlius were now denounced as traitors, and an army under the consul, Antonius, was sent against them. The conspirators who remained in Rome, the chief of whom was Lentulus, were arrested, tried, condemned, and executed, Dec. 5. The insurrections in several parts of Italy were meanwhile suppressed; many who had resorted to Catiline's camp in Etruria, deserted when they heard what had taken place in Rome, and his intention to proceed into Gaul was frustrated. In the beginning of Jan. (62), he returned by Pistoria (now Pistoja) into Etruria, where he encountered the forces under Antonius, and, after a desperate battle, in which he displayed almost superhuman courage and enthusiasm, was defeated and slain. The appearance of Catiline was in harmony with his character. He had a daring and reckless look; his face was haggard with a sense of crime; his eyes were wild and bloodshot, and his step unsteady, from nightly debauchery. The history of the Catiline conspiracy is given by Sallust in a remarkably concise and nervous style.

CATI'NEAU-LAROCHE, Pierre Marie Sébastien, 1772–1828; a French philologist who emigrated to San Domingo, where his antislavery sentiments were so obnoxious that he was prosecuted and saved from death only by the interference of the home government. He went to Cape Haytien, where in the great massacre he alone of 17 Frenchmen was saved. He returned to Paris by way of the United States, set up a printing-office, and produced several dictionaries. In 1819, he was sent by the government to study the climate of French Guiana, and three years later his notes were published.

CA'TION. See ANODE.

CATKIN, *Amentum,* in botany, a spike of numerous, small, unisexual flowers, destitute of calyx and corolla, and furnished with scale-like bracteæ instead, the whole inflorescence finally falling off by an articulation in a single piece. Examples are found in the willow, hazel, oak, birch, alder, and other trees and shrubs, forming the natural order amentaceæ (q.v.). In some, as in the oak and hazel, the male flowers only are in catkins.

CATLIN, GEORGE, 1796–1872; b. Penn.; an artist celebrated for his travels, writings, and portraits of American Indians. He was bred to the law and practiced for a year or two in Philadelphia, but having a taste for art he established himself in New York as a portrait-painter. About 1832, he became impressed with the fact, that the most remarkable American Indians were fast disappearing, and resolved to rescue at least the portraits of some of them from oblivion. In pursuit of this object he traveled and dwelt among the aboriginal tribes in North and South America, acquiring their languages, and thoroughly studying their manners and customs, traditions, history, and modes of life. After collecting many portraits, and many sketches of life and scenery, he published in London, in 1841, a large work on the *Manners, Customs, and Condition of the North American Indians,* with 300 illustrations. In 1844, followed the *North American Portfolio of Hunting Scenes;* in 1848, *Eight Years' Travels and Residence in Europe,* in which he gives the stories of several Indians whom he had introduced to various European courts. In 1864, he published a little monograph which created much interest among medical men, entitled *The Breath of Life,* in which he argued the importance of keeping one's mouth closed when sleeping—an idea doubtless suggested by the fact that the Indians use special care in this respect. His last work was *Last Rambles among the Indians of the Rocky Mountains and the Andes.*

CATMANDOO. See KHATMANDU, *ante.*

CATMINT, *Nepeta cataria,* a plant of the natural order *labiatæ,* pretty common in England, in chalky and gravelly soils, but rare in Scotland and Ireland, widely diffused throughout Europe and the middle latitudes of Asia, and of North America; remarkable for the fondness which cats display for it. It appears to act upon them in a similar way to valerian root; and when its leaves are bruised so as to be highly odoriferous, they are at once attracted to it, rub themselves on it, tear at it, and chew it. Its odor has been described as intermediate between that of mint and that of pennyroyal. It has erect stems, 2 to 3 ft. high, dense whorls of many whitish flowers, tinged and spotted with rose-color, and stalked heart-shaped leaves of a velvety softness, whitish and downy beneath.—Other species are numerous in the s. of Europe, and middle latitudes of Asia.

CATNIP. See CATMINT, *ante.*

CA'TO, DIONYSIUS, is the name prefixed to a little volume of moral precepts in verse, which was a great favorite during the middle ages. Whether or not such a person ever existed, is a point of the greatest uncertainty. The title which the book itself commonly bears, is *Dionysii Catonis Disticha de Moribus ad Filium.* Its contents have been differently estimated: some scholars have considered the precepts admirable; others, weak and vapid: some have found indications of a superior scriptural knowledge; others, of a deep-rooted paganism. The style has been pronounced the purest Latin and the most corrupt jargon. The truth would seem to be, that on a ground-work of excellent Latin of the silver age, the illiterate monks of a later period have, as it were, inwoven a multitude of their own barbaric errors, which preclude us from determining precisely the period when the volume was composed. It begins with a preface addressed by the supposed author to his son, after which come 56 injunctions of rather a simple character, such as *parentem ama.* This is followed by the substance and main portion of the book—viz., 144 moral precepts, each of which is expressed in two dactylic hexameters. During the middle ages, the *Disticha* was used as a text-book for young scholars. In the 15th c., more than 30 editions were printed. The best edition, however, is that published at Amsterdam in 1754 by Otto Arntzenius. Caxton translated it into English.

CA'TO, MARCUS PORCIUS, surnamed *Censorius* and *Sapiens* ("the wise"), afterwards known as CATO PRISCUS or CATO MAJOR—to distinguish him from Cato of Utica—was b. at Tusculum in 234 B.C. He inherited from his plebeian father a small farm in the country of the Sabines, where he busied himself in agricultural operations, and learned to love the simple and severe manners of his Roman forefathers, which still lingered round his rural home. Induced by Lucius Valerius Flaccus to remove to Rome when that city was in a transition epoch, from the old-fashioned strictness and severe frugality of social habits, to the luxury and licentiousness of Grecian manners, C. appeared to protest against this, to denounce the degeneracy of the Philo-hellenic party, and to set a pattern of sterner and purer character. He soon distinguished himself as a pleader at the bar of justice, and after passing through minor offices, was elected consul. In his province of Nearer Spain, where an insurrection had broken out after the departure of the elder Scipio (206 B.C.), C. was so successful in quelling disturbances and restoring order, that in the following year he was honored by a triumph. C. exhibited extraordinary military genius in Spain; his stratagems were brilliant, his plans of battle were

marked by great skill, and his general movements were rapid, bold, and unexpected. In 187 B.C., a fine opportunity occurred for the display of "antique Roman" notions. M. Fulvius Nobilior had just returned from Ætolia victorious, and sought the honor of a triumph. C. objected. Fulvius was indulgent to his soldiers, a man of literary taste, etc., and C. charges him, among other enormities, with "keeping poets in his camp." These rude prejudices of C. were not acceptable to the senate, and C.'s opposition was fruitless. In 184 B.C., C. was elected censor, and discharged so rigorously the duties of his office, that the epithet *Censorius*, formerly applied to all persons in the same station, was made his permanent surname. Many of his acts were highly commendable. He repaired the water-courses, paved the reservoirs, cleansed the drains, raised the rents paid by the publicans for the farming of the taxes, and diminished the contract prices paid by the state to the undertakers of public works. More questionable reforms were those in regard to the price of slaves, dress, furniture, equipage, etc. His despotism in enforcing his *own* idea of decency may be illustrated from the fact, that he degraded Manilius, a man of prætorian rank, for having kissed his wife in his daughter's presence in open day. C. was a thoroughly dogmatic moralist, intolerant, stoical, but *great*, because he manfully contended with rapidly swelling evils; yet not *wise*, because he opposed the bad and the good in the innovations of his age with equal animosity.

In the year 175 B.C., C. was sent to Carthage to negotiate on the differences between the Carthaginians and the Numidian king Masinissa; but having been offended by the Carthaginians, he returned to Rome, where, ever afterwards, he described Carthage as the most formidable rival of the empire, and concluded all his addresses in the senate-house—whatever the immediate subject might be—with the well-known words: "*Ceterum censeo, Carthaginem esse delendam*" ("For the rest, I vote that Carthage must be destroyed").

Though C. was acquainted with the Greek language and its literature, his severe principles led him to denounce the latter as injurious to national morals. He died 149 B.C., at the age of 85. C. was twice married. In his eightieth year, his second wife, Salonia, bore him a son, the grandfather of Cato of Utica. C. treated his slaves with shocking harshness and cruelty. In his old age, he became greedy of gain, yet never once allowed his avarice to interfere with his honesty as a state-functionary. He also composed various literary works, such as *De Re Rustica* (a treatise on agriculture)—much corrupted, however. The best editions are by Gesner and Schneider in their *Scriptores Rei Rusticæ*. His greatest historical work, *Origines*, has, unfortunately, perished; but some few fragments are given in Krause's *Historicorum, Romanorum Fragmenta* (Berlin, 1833). Fragments of C.'s orations—of which as many as 150 were read by Cicero—are given in Meyer's *Oratorum Romanorum Fragmenta* (Zurich, 1842).

CA'TO, MARCUS PORCIUS, named CATO THE YOUNGER, or CATO UTICENSIS (from the place of his death), was born 95 B.C. Having lost, during childhood, both parents, he was educated in the house of his uncle, M. Livius Drusus, and, even in his boyhood, gave proofs of his decision and strength of character. In the year 72 B.C., he served with distinction in the campaign against Spartacus, but without finding satisfaction in military life, though he proved himself a good soldier. From Macedonia, where he was military tribune in 67, he went to Pergamus in search of the Stoic philosopher, Athenodorus, whom he brought back to his camp, and whom he induced to proceed with him to Rome, where he spent the time partly in philosophical studies, and partly in forensic discussions. Desirous of honestly qualifying himself for the quæstorship, he commenced to study all the financial questions connected with it. Immediately after his election, he introduced, in spite of violent opposition from those interested, a rigorous reform into the treasury offices. He quitted the quæstorship at the appointed time amid general applause. In 63 B.C., he was elected tribune, and also delivered his famous speech on the Catiline conspiracy, in which he denounced Cæsar as an accomplice of that political desperado, and determined the sentence of the senate. Strongly dreading the influence of unbridled greatness, and not discerning that an imperial genius—like that of Cæsar—was the only thing that could remedy the evils of that overgrown monster, the Roman republic, he commenced a career of what seems to us blind pragmatical opposition to the three most powerful men in Rome—Crassus, Pompey, and Cæsar. C. was a noble but strait-laced *theorist*, who lacked the intuition into circumstances which belongs to men like Cæsar and Cromwell. His first opposition to Pompey was successful; but his opposition to Cæsar's consulate for the year 59 not only failed, but even served to hasten the formation of the first triumvirate between Cæsar, Pompey, and Crassus. He was afterwards forced to side with Pompey, who had resiled from his connection with Cæsar, and become reconciled to the aristocracy. After the battle of Pharsalia (48 B.C.), C. intended to join Pompey, but hearing the news of his death, escaped into Africa, where he was elected commander by the partisans for Pompey, but resigned the post in favor of Metellus Scipio, and undertook the defense of Utica. Here, when he had tidings of Cæsar's decisive victory over Scipio at Thapsus (April 6, 46 B.C.), C., finding that his troops were wholly intimidated, advised the Roman senators and knights to escape from Utica, and make terms with the victor, but prohibited all intercessions in his own favor. He resolved to die rather than surrender, and, after spending the night in reading Plato's *Phædo*, committed suicide by stabbing himself in the breast.

CAT'ODON and CATODON'TIDÆ. See CACHOLOT.

CAT-O'-NINE-TAILS. See FLOGGING.

CATOO'SA, a co. in n.w. Georgia, watered by affluents of the Tennessee river, and crossed by the Western and Atlantic railroad; 175 sq.m.; pop. '80, 4,739—612 colored. The region is hilly, with much woodland. The productions are chiefly agricultural. Co. seat, Ringgold.

CATOP'TRICS. The divisions of the science of optics are laid out and explained in the article OPTICS (q.v.). C. is that subdivision of geometrical optics which treats of the phenomena of light incident upon the surfaces of bodies, and reflected therefrom. All bodies reflect more or less light, even those through which it is most readily transmissible; light falling on such media, for instance, at a certain angle, is totally reflected. Rough surfaces scatter or disperse (see DISPERSION OF LIGHT) a large portion of what falls on them, through which it is that their peculiarities of figure, color, etc., are seen by eyes in a variety of positions; they are not said to *reflect* light, but there is no doubt they do, though in such a way, owing to their inequalities, as never to present the phenomena of reflection. The surfaces with which C., accordingly, deals, are the smooth and polished. It tracks the course of *rays* and *pencils* of light after reflection from such surfaces, and determines the positions, and traces the forms, of images of objects as seen in mirrors of different kinds.

A ray of light is the smallest conceivable portion of a stream of light, and is represented by the line of its path, which is always a straight line. A pencil of light is an assemblage of rays constituting either a cylindrical or conical stream. A stream of light is called a converging pencil when the rays converge to the vertex of the cone, called a focus; and a diverging pencil, when they diverge from the vertex. The axis of the cone in each case is called the axis of the pencil. When the stream consists of parallel rays, the pencil is called cylindrical, and the axis of the cylinder is the axis of the pencil. In nature, all pencils of light are primarily diverging—every point of a luminous body throwing off light in a conical stream; converging rays, however, are continually produced in optical instruments, and when light diverges from a very distant body, such as a fixed star, the rays from it falling on any small body, such as a reflector in a telescope, may, without error, be regarded as forming a cylindrical pencil. When a ray falls upon any surface, the angle which it makes with the normal to the surface at the point of incidence is called *the angle of incidence;* and that which the reflected ray makes with the normal, is called *the angle of reflection.*

Two facts of observation form the ground-work of catoptrics. They are expressed in what are called the laws of reflection of light: 1. In the reflection of light, the incident ray, the normal to the surface at the point of incidence, and the reflected ray, lie all in one plane. 2. The angle of reflection is equal to the angle of incidence. These laws are simple facts of observation and experiment, and they are easily verified experimentally. Rays of all colors and qualities follow these laws, so that white light, after reflection, remains undecomposed. The laws, too, hold, whatever be the nature, geometrically, of the surface. If the surface be a plane, the normal is the perpendicular to the plane at the point of incidence; if it be curved, then the normal is the perpendicular to the tangent plane at that point. From these laws and geometrical considerations may be deduced all the propositions of catoptrics. In the present work, only those can be noticed whose truth can in a manner be exhibited to the eye without any rigid mathematical proof. They are arranged under the heads *plane surfaces* and *curve surfaces.*

Plane Surfaces.—1. When a pencil of parallel rays falls upon a plane mirror, the reflected pencil consists of parallel rays. A glance at the annexed figure (fig. 1),

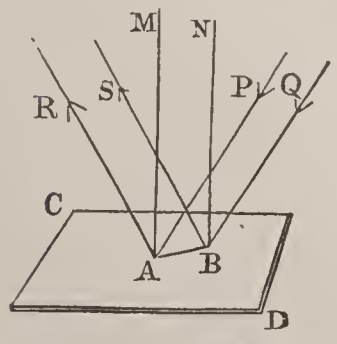


Fig. 1.

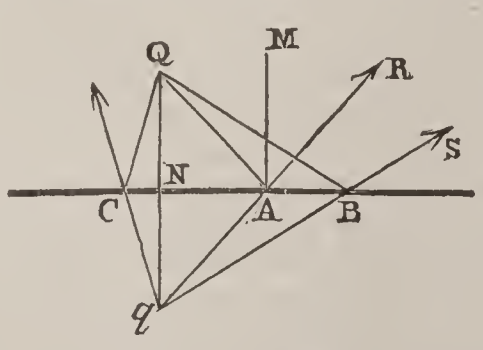


Fig. 2.

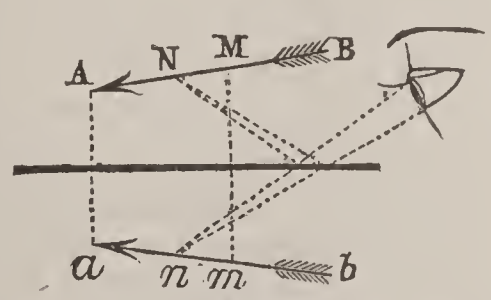


Fig. 3.

where PA and QB are two of the incident rays, and are reflected in the directions AR and BS respectively, will make the truth of this pretty clear to the eye. The proposition, however, may be rigidly demonstrated by aid of Euclid, book xi., with which, however, we shall not presume the reader to be acquainted. The reader may satisfy himself of its truth practically by taking a number of rods parallel to one another and inclined to the floor, and then turning them over till they shall again be equally inclined to the floor, when he will again find them all parallel.—2. If a diverging or converging pencil is incident on a plane mirror, the focus of the reflected pencil is situated on the opposite side of the mirror to that of the incident pencil, and at an equal distance from it. Suppose the pencil to be diverging from the focus Q (fig. 2), on the

mirror of the surface of which CB is a section. Draw QNq perpendicular to CB and make qN=QN, the nq is the focus of the reflected rays. For let QA, QB, QC be any of the incident rays in the plane of the figure; draw the line AM perpendicular to CB, and draw AR, making the angle MAR equal to the angle of incidence, MAQ. Then AR is the reflected ray. Join qA. Now it can be proved geometrically, and indeed is apparent at a glance, that qA and AR are in the same straight line; in other words, the reflected ray AR proceeds as if from q. In the same way, it may be shown that the direction of any other reflected ray, as BS, is as if it proceeded from q; in other words, q is the focus of reflected rays; it is, however, only their *virtual* focus. See art. Focus. If a pencil of rays converged to q, it is evident that they would be reflected to Q as their real focus, so that a separate proof for the case of a converging pencil is unnecessary. The reader who has followed the above will have no difficulty in understanding how the position and form of the image of an object placed before a plane mirror—as in fig. 3, where the object is the arrow AB, in the plane of the paper, to which the plane of the mirror is perpendicular—should be of the same form and magnitude as the object (as *ab* in the fig.), and at an equal distance from the mirror, on the opposite side of it, but with its different parts inverted with regard to a given direction. The highest *a*, for instance, in the image, corresponds with the lowest point, A, in the object. He will also understand how, in the ordinary use of a looking-glass, the right hand of the image corresponds to the left hand of the object.

When two plane mirrors are placed with their reflecting surfaces towards each other, and parallel, they form the experiment called the endless gallery. Let (in fig. 4) the arrow, Q, be placed vertically between the parallel mirrors, CD, BA, with their silvered faces turned to one another, Q will produce in the mirror CD the image q^1. This image will act as a new object to produce with the mirror BA the image q^2, which, again, will produce with the mirror CD another image, and so on. Another series of images, such as q', q'', etc., will similarly be produced at the same time, the

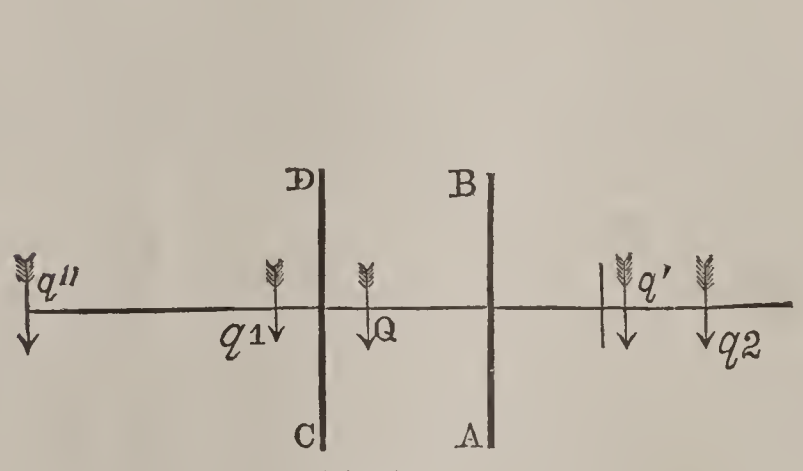


Fig. 4.

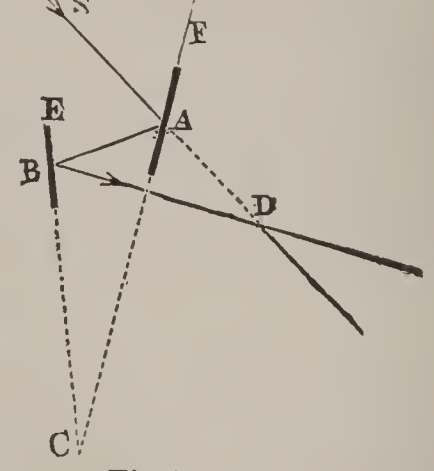


Fig. 5

first of the series being q', the image of Q in the mirror BA. By an eye placed between the mirrors, the succession of images will be seen as described; and if the mirrors were perfectly plane and parallel, and reflected all the light incident on them, the number of the images of both series would be infinite. If, instead of being parallel, the mirrors are inclined at an angle, the form and position of the image of an object may be found in precisely the same way as in the former case, the image formed with the first mirror being regarded as a new (virtual) object, whose image, with regard to the second, has to be determined. For a curious application of two plane mirrors meeting and inclined at an angle an aliquot part of 180°, see art. Kaleidoscope.—3. The two propositions already established are of extensive application, as has partly been shown. They include the explanation of all phenomena of light related to plane mirrors. The third proposition is one also of considerable utility, though not fundamental. It is: When a ray of light has been reflected at each of two mirrors inclined at a given angle to each other, in a plane perpendicular to their intersection, the reflected ray will deviate from its original course by an angle double the angle of inclination of the mirrors. Let A and B (fig. 5) be sections of the mirrors in a plane perpendicular to their intersection, and let their directions be produced till they meet in C. Let SA, in the plane of A and B, be the ray incident on the first mirror at A, and let AB be the line in which it is thence reflected to B. After reflection at B, it will pass in the line BD, meeting SA, its original path, produced in D. The angle ADB evidently measures its deviation from its original course, and this angle is readily shown to be double of the angle at C, which is that of the inclination of the mirrors. It is on this proposition that the important mathematical instruments called the quadrant and sextant (q.v.) depend

Curved Surfaces.—As when a pencil of light is reflected by a curved mirror, each ray follows the ordinary law of reflection, in every case in which we can draw the normals for the different points of the surface, we can determine the direction in which the various rays of the pencil are reflected, as in the case of plane mirrors. It so happens that normals can be easily drawn only in the case of the sphere, and of a few

"surfaces of revolution," as they are called. These are the paraboloid, the ellipsoid, and the hyperboloid of revolution. The paraboloid of revolution is of importance in optics, as it is used in some specula for telescopes. See arts. SPECULUM and TELESCOPE. The three surfaces last named are, however, all of them interesting, as being for pencils of light incident in certain ways what are called surfaces of accurate reflection—i.e., they reflect all the rays of the incident pencil to a single point or focus. We shall explain to what this property is owing in the case of the parabolic reflector, and state generally the facts regarding the other two.

1. The concave parabolic reflector is a surface of accurate reflection for pencils of rays parallel to the axis or central line of figure of the paraboloid. This results from the property of the surface, that the normal at any point of it passes through the axis, and bisects the angle between a line through that point, parallel to the axis, and a line joining the point to the focus of the generating parabola. Referring to fig. 6, suppose a ray incident on the surface at P, in the line SP, parallel to the axis AFG. Then if F be the focus of the generating parabola, join PF. PF is the direction of the reflected ray. For PG, the normal at P, by the property of the surface, bisects the angle FPS, and therefore ∠ (angle) FPG = ∠ GPS. But SPG is the angle of incidence, and SP, PG, and FP are in one plane, and, therefore, by the laws of reflection, FP is the reflected ray. In the same way, all rays whatever, parallel to the axis, must pass through F after reflection. If F were a luminous point, the rays from it, after reflection on the mirror, would all proceed in a cylindrical pencil parallel to the axis. This reflector, with a bright light in its focus, is accordingly of common use in lighthouses.

2. In the concave ellipsoid mirror there are two points—viz., the foci of the generating ellipse, such that rays diverging from either will be accurately reflected to the other. This results from the property of the figure, that the normal at any point bisects the angle included between lines drawn to that point from the foci.

3. Owing to a property of the surface similar to that of the ellipsoid, a pencil of rays converging to the exterior focus of a hyperbolic reflector, will be accurately reflected to the focus of the generating hyperbola.

The converse of the above three propositions holds in the case of the mirrors being convex.

Though the sphere is not a surface of accurate reflection, except for rays diverging from the center, and which on reflection are returned thereto, the spherical reflector is of great practical importance, because it can be made with greater facility and at less expense than the parabolic reflector. See art. TELESCOPE. It is necessary, then, to investigate the phenomena of light reflected from it.

4. *Spherical Mirrors.*—It is usual to treat of two cases, the one the more frequent in practice, the other the more general and comprehensive in theory. First, then, to find the focus of reflected rays when a small pencil of parallel rays is incident directly on a concave spherical mirror. Let BAB′ (fig. 7) be a section of the mirror, O its center of curvature, and A the center of its aperture. AO is the axis of the mirror, and therefore of the incident pencil, because it is incident directly on the mirror; a pencil being

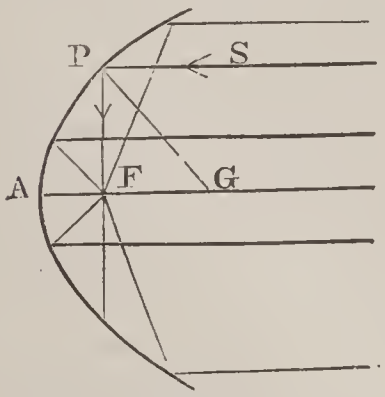


Fig. 6.

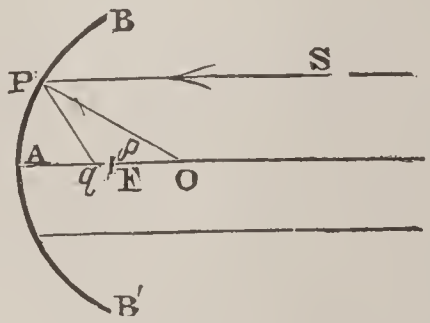


Fig. 7.

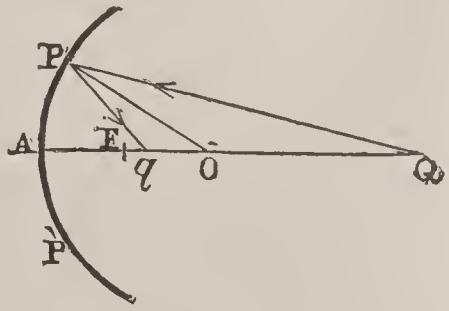


Fig. 8.

called oblique when its axis is at an angle to the axis of the mirror. As the ray incident in the line OA will be reflected back in the same line—OA being the normal at A—the focus of reflected rays must be in OA. Let SP be one of the rays; it will be reflected so that ∠ qPO = ∠ SPO. But ∠ POq = ∠ OPS by parallel lines. Therefore, ∠ qPO = ∠ qOP, and Pq and Oq are equal. If, now, the incident pencil be very small—i.e., if P be very near A—then the line Pq will very nearly coincide with the line OA, and Pq and Oq will each of them become very nearly the half of OA. Let F be the middle point of OA—the point, namely, to which q tends as the pencil diminishes. The F is called the principal focus of the mirror, and AF the principal focal length, which is thus = ½ radius of the mirror. It will be observed that when AP is not small, q lies between A and F. Fq is called the aberration of the ray. When AP is large, the reflected rays will continually intersect, and form a luminous curve with a cusp at F. This curve is called the caustic (q.v.). We shall now proceed to the more general case of a small pencil of diverging rays, incident directly on a concave spherical mirror. Let PAP′ (fig. 8) be a section of the mirror, A the center of its aperture, O of its curvature, and let F be its principal focus. Then, if Q be the focus of incident rays (as if proceeding from

a candle there situated), q, the focus of the reflected rays, lies on QOA, since the pencil is incident directly, and the ray QOA, being incident in the line of the normal OA, is reflected back in the same line. Let PQ be any other ray of the pencil. It will be reflected in Pq, so that $\angle\, q\mathrm{PO} = \angle \mathrm{OPQ}$; and on the supposition that PA is very small, so that QP becomes nearly equal to QA, and qP to qA, it can be shown, by Euclid, vi. 3, that $\frac{\mathrm{QO}}{\mathrm{QA}} = \frac{q\mathrm{O}}{q\mathrm{A}}$ very nearly. From this equation is deduced the formula $q\mathrm{A} = \frac{\mathrm{QA} \times \mathrm{AF}}{\mathrm{QA} - \mathrm{AF}}$, which enables us to find qA, when QA and AF are known. Thus, let the radius of curvature be 12 in., and the distance of the source of the rays, or QA, 30 in., the focal length $q\mathrm{A} = \frac{30 \times 6}{30 - 6} = 7\frac{1}{2}$ inches. If the rays had diverged upon q, it is clear they would have been reflected to Q. The points Q and q, accordingly, are called conjugate foci.

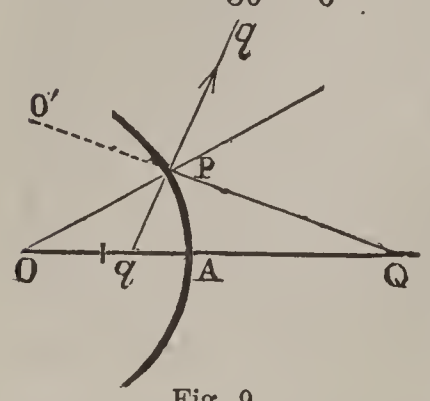


Fig. 9.

If the mirror be convex, as in fig. 9, instead of concave, and a pencil of diverging rays be incident directly on it from Q, we should find, proceeding in exactly the same way as in the former case, the equation $\mathrm{A}q = \frac{\mathrm{QA} \times \mathrm{AF}}{\mathrm{QA} + \mathrm{AF}}$; or taking the same numbers as before; $q\mathrm{A} = \frac{30 \times 6}{30 + 6} = 5$ inches.

For information regarding the formation of images by spherical mirrors, the reader may consult Potter's *Elements of Optics*. See also the arts. Mirrors and Images.

By considering fig. 8, it is easy to see how the relative positions of the two *conjugate* foci, as they are called, Q and q, vary as the distance, AQ, of the origin of the rays is changed. As Q is advanced towards O, q also approaches O, since the angles QPO and qPO always remain equal; and when the source of the light is in the center, O, of the sphere, the reflected rays are all returned upon the source. As Q, again, recedes from O, q moves towards F, which it does not quite reach until the distance of Q is infinite, so that the incident rays may be considered as parallel, as in fig. 7. If Q is placed between O and F, then q will be to the right of O; and when Q coincides with F, the reflected rays will have no focus, but will be parallel. If Q is between F and A, the reflected rays will diverge, and will have their virtual focus to the left of A. The correctness of these deductions may easily be verified. The positions of the conjugates are traced in precisely the same way for the convex mirror, and the reader who is interested will find no difficulty in tracing them for himself.

CATOP'TROMANCY, divination by the mirror or looking-glass. At Patras, in Greece, the sick foretold their death or recovery by means of a mirror let down with a thread until its base touched the water in a fountain before the temple of Ceres. The face of the sick person appearing healthy in the mirror, betokened recovery; if it looked ghastly, then death was sure to ensue. More modern superstitions attach ill-luck to the breaking of a looking-glass, and to seeing one's face in a glass by candle-light.

CATS, Jacob, a Dutch statesman and poet, was b. at Brouwershaven, in Zeeland, in 1577, and after studying law, finally settled at Middelburg. He rose to high offices in the state, and was twice sent as ambassador to England, first in 1627, and again in 1652, while Cromwell was at the head of affairs. He died 1660. As a poet, he enjoyed the highest popularity. His poems are characterized by simplicity, rich fancy, clearness, and purity of style, and excellent moral tendency. The most highly prized of his productions were the *Huwelyk, Trouwringh* (a series of romantic stories relating to remarkable marriages), and the *Spiegel van den Ouden in Nieuwen Tyd.* The best edition of his works appeared at Amsterdam, in 19 vols., 1790–1800.

CAT'S-EYE, a beautiful mineral, a variety of quartz receiving its name from the resemblance which the reflection of light from it, especially when cut *en cabochon*, or in a convex form, is supposed to exhibit to the light which seems to emanate from the interior of the eye of a cat. It has a sort of pearly appearance, and is *chatoyant* or characterized by a fine play of light, which results from the parallel arrangement of the minute fibers of the stone itself, or from an intimate mixture of some foreign substance, such as amianthus. It has been supposed that cat's-eye is silicified wood. It is of various colors, and is obtained chiefly from Malabar and Ceylon. The Singhalese are especially proud of it, believing it, although erroneously, to be only found in their island. It is often brought from that island, cut to resemble a monkey's face, from the idolatrous regard entertained for the monkey. A chatoyant variety of feldspar has been sometimes confounded with cat's-eye, and is also found in Ceylon.

CATSKILL, a village on the Hudson river, in e. New York, the capital of Greene co., 34 m. s. of Albany; pop. '80, 8,311. C. is one of the landing places for the thousands of visitors who go annually to the Catskill mountains, a few miles westward. A ferry across the river connects with the Hudson River railroad. There are several important manufactories in the village.

CATSKILL GROUP, in geology, the name of rocks of the Devonian system seen in the northern counties of Pennsylvania. They are chiefly red sandstone and shale, and

contain fossil scales of the earliest fishes. The Catskill mountains were formerly supposed to belong in this group, whence the name, now known to be inappropriate.

CATSKILL MOUNTAINS, a group of the Alleghany chain, in its largest sense, situated near the right bank at once of the Hudson and of the Mohawk, in the state of New York. The loftiest points, Round Top and High Peak, are respectively 3,800 ft. and 3,720 above tide-water; and, on a third eminence, a terrace of 2,500 ft. above the same level presents Catskill Mountain house, a favorite retreat in summer. The group is drained chiefly by Catskill creek, which, at a village of its own name, enters the Hudson 111 m. above its mouth, and 34 below the confluence of the Mohawk.

CATSKILL MOUNTAINS (*ante*), a part of the Appalachian system w. of the Hudson, river in Greene co., N. Y. The group, about 12 m. long, nearly parallel with the river about, 8 m. distant, turns westward in spurs extending many miles. Besides the Ulster and Delaware railroad, beginning at Kingston and leading w. into the mountains, there is a good wagon road from Catskill village to the "Mountain House," 12 m. w., which is a favorite summering place. The house stands on a terrace 2,231 ft. above the river, and almost at the edge of a perpendicular cliff several hundred ft. high. There is another public house on Overlook mountain, a few miles to the s., which is estimated to be 3,800 ft. above tide. The views from these houses and from the neighboring peaks are wonderfully varied and beautiful, reaching from the Green mountains in Vermont to the highlands at West Point, and taking in nearly 100 m. of the Hudson river and valley, with numerous cities and villages, and a vast expanse of highly cultivated farming country. An immense number of summer boarders are accommodated through all this region, not only in hotels, but also in countless farm-houses and village homes. One of the highest points is the top of Overlook, 3,800 feet. The other prominent elevations are Hunter mountain, High peak, and Round Top. One of the sights of the region is "The Clove," or ravine, and the falls therein. The ravine is about 5 m. long. At its head two rivulets unite and flow rapidly to a point where the mountain divides and forms a deep hollow into which the brook rushes over a cascade of 180 ft.; and further down are other falls, one of 80 and another of 40 feet. The ice formation in winter around the highest fall is particularly grand and beautiful. There are other ravines and water-falls in the region, but none equally important. The mountains are for the most part covered with thick forests of oak, hickory, ash, maple, beech, pine, etc.

CAT'S-TAIL. See TYPHA.

CAT'S-TAIL GRASS. See TIMOTHY GRASS.

CATTACK. See CUTTACK, *ante*.

CATTARAUGUS, a co. in w. New York, on the Pennsylvania border, watered by the Allegheny and other rivers, and intersected by the New York and Erie and the Atlantic and Great Western railroads, and the Genesee Valley canal; 1250 sq.m.; pop. '80, 55,808. The surface is undulating and the soil fruitful. The chief products are wheat, corn, oats, potatoes, hay, cheese, butter, wool, hops, and maple sugar. Iron, manganese, marl, peat, and sulphur are found. Co. seat, Little Valley.

CAT'TARO, a t. of Austria, in the crown-land of Dalmatia, is situated at the head of the gulf of Cattaro, about 36 m. s.e. of Ragusa. It is strongly fortified, and surrounded on all sides by mountains. The castle, a massive and almost inaccessible building, stands on a precipitous rock immediately behind the town. C. has a cathedral several churches and hospitals, and a population of 3,000. C., which was at one time the capital of a small republic, was in 1807 annexed to the kingdom of Italy, but was handed over to Austria in 1814 by the treaty of Vienna.—CATTARO, GULF OF, or BOCCA DI CATTARO, an inlet of the Adriatic, near the s. extremity of the Dalmatian coast. It consists of three basins or lakes, connected by straits of about half a mile in breadth. The outer entrance is only a mile and a half wide, and the total length of the gulf is about 30 miles. Mountains protect it from all winds, and it has a depth of from 15 to 20 fathoms.

CAT'TEGAT, or KATTEGAT (*Sinus Codanus*), the bay or arm of the sea situated between the e. coast of Jütland and the w. coast of Sweden, to the n. of the Danish islands. It is connected with the Baltic sea by the Great and Little Belt (q.v.), and by the sound. The Skager Rack (q.v.) connects it with the North sea. The length of the C. is about 150 m , and its greatest breadth 85 miles. It is of unequal depth, and has dangerous sand-banks. The principal islands are Lasöe, Samsöe, and Anhalt. The Danish shores of the C. are low, but the Swedish shore is very steep and rocky.

CATTERMOLE, GEORGE, one of the most distinguished of English painters in water-colors, was born at Dickleburgh, Norfolk, in 1800. His pictures, which embrace a wide range of subjects, are remarkable for their striking originality of conception, vigorous execution, and fine color and tone. One of his best known and greatest pictures is "Luther at the Diet of Spires," containing 33 portraits of the principal characters, copied from the authentic originals by the old masters. He also designed the engravings for his brother's *History of the Civil Wars*, and illustrated many scenes in Scott's novels and in Shakespeare. His later works are chiefly oil-paintings. He d. July 24, 1868.

CATTI, or CHATTI, a German people, included by Cæsar under the name Suevi (q.v.), who inhabited a country pretty nearly corresponding to the present Hesse. The south-western part of their territory, around *Mattiacum*, was conquered by the Romans under Drusus. The C. took part in the general rising of the Germans under Hermann. Tacitus praises them as excellent foot-soldiers. During the reign of Marcus Aurelius, in the end of the 2d c., they made incursions into Roman Germany and Rhætia. Caracalla failed in an expedition against them and the Alemanni in the 3d century. About the middle of that century, their name began to give place to that of the Franks (q.v.), and is last mentioned by Claudian in the latter part of the 4th century.

CATTLE. See OX.

CATTLE, in English law. See CHATTEL.

***CATTLE-PLAGUE**, RINDERPEST (Ger.), or STEPPE MURRAIN, is a contagious eruptive fever, or exanthema, of the bovine species; sheep, goats, deer, and other allied species occasionally, however, catch it from cattle. It occurs indigenously on the plains of western Russia, whence it has at various times overspread most parts of the old world. The specific virus from diseased or infected animals is the only source of cattle-plague; no filth, overcrowding, or other health-depressing cause has hitherto produced it. As in small-pox, scarlatina, and other eruptive fevers, an incubative stage, varying between two and twenty days, intervenes between the introduction of the virus into the system, either by inoculation or contagion, and the development of the characteristic symptoms. These consist essentially of congestion of the mucous and cutaneous surfaces, with a sort of aphthous eruption, and thickening, softening, and desquamation of the superficial investing membrane. The disease runs a tolerably fixed and definite course, which is not materially altered by any known remedial measures. It seldom attacks the same individual a second time.

History.—The cattle-plague has been recognized for upwards of a thousand years. It appears to have destroyed the herds of the warlike tribes who overran the Roman empire during the 4th and 5th centuries. About 810, it traveled with the armies of Charlemagne into France, and about the same period is also supposed to have visited England. Several times throughout the course of every century it spread from the plains of Russia over the western countries of Europe, and is stated to have again visited England about 1225. Although occasioning, every few years, great losses on the continent of Europe, the plague does not appear to have again shown itself in England until 1714, when it appeared at Islington about the middle of July, was very destructive for about three months, but was again got rid of towards Christmas. In 1744, it was in Holland, destroying there, in two years, 200,000 cattle; in Denmark, from 1745–49, it killed 280,000; in some provinces of Sweden it spared only 2 per cent of the horned cattle. It made terrible havoc throughout Italy, destroying 400,000 beasts in Piedmont alone. In April, 1745, the plague was again imported into England, probably by some white calves from Holland, where, as already stated, it had for some time prevailed. It continued its devastations for twelve years, but it is now impossible accurately to discover the losses it occasioned. In the third and fourth years of its ravages, 80,000 cattle were slaughtered, and double that number are supposed to have died. In 1747, 40,000 cattle died in Nottingham and Lancashire alone; whilst, so late as 1757, 30,000 perished in Cheshire in six months. In March, 1770, the disease was brought with some hay from Holland to Portsoy, in the Moray firth; several cattle died, and others, to the value of £799, 12*s.* 2*d.*, being destroyed, the further spread of the pest was prevented. By the wars which wasted Europe towards the close of the last and first eighteen years of the present century, cattle-plague was spread widely over the continent, and occasioned, wherever it occurred, terrible losses. Since then, at short intervals, it has spread—always being traceable to its source on the Russian plains—over Poland, Hungary, Austria, Prussia, portions of Germany and Italy, and has extended to Egypt. It has also reached China and Japan.

The British outbreak of 1865–67, like its predecessors, undoubtedly came from Russia. The steamer *Tonning*, from Revel, brought 331 cattle and 330 sheep into Hull on 29th May, 1865. A portion of the cattle had come from the interior of Russia, where the plague then was, or recently had been; the cargo was rapidly landed, and very hurriedly inspected. Nearly half of the cattle were distributed in various lots to butchers in Leeds, Derby, and Manchester, but, curiously, these do not appear to have left any contagion in their trail. One hundred and seventy-five came to London, remained from the Monday evening until Thursday's market in lairs at York road, adjoining the cattle-market. It was stated, in a leader in the *Times* of 15th Aug., that rinderpest was seen in the metropolitan market as early as 12th June. Certain it is that more than one lot purchased on 19th June carried the disease to several dairies in and about London. The first cases were mistaken for cases of poisoning, the cows they had stood beside were sent into market, and thus the subtle disorder in a few weeks spread into many dairies both in town and country. Twenty-three Dutch cattle, having stood over for several markets, were sent back to Holland on 2d July, carried with them the contagion, were placed in a field near Schiedam, but soon sickened and died, thus spreading the disease in Holland. During the next six months, plague was repeatedly reimported thence into England. Until 11th Aug., 1865, no restrictions whatever were

put upon the removal of cattle; diseased and infected animals were freely taken to fairs and markets, were openly traveled by road and rail; whilst the metropolitan market continued every week to send forth infected cases, not only to the neighboring counties, but to Southampton, Birmingham, Hereford, Liverpool, Edinburgh, and even to Aberdeenshire. As early as 18th July, the pest was brought from London to Huntly by four calves; subsequent outbreaks occurred in the same way. The stamping-out system was, however, early and rigidly enforced in Aberdeenshire, and eight distinct outbreaks were promptly got rid of.

In Edinburgh, it appeared probably about 9th Aug., was brought from London by some low-priced foreign cows; in six weeks, about 800, or one half the dairy cows in Edinburgh, had died—200 having been buried in one trench. By the end of Jan., four fifths of the dairy cows had perished, but Edinburgh was reported clear. In Glasgow, the first case occurred on 19th Aug., in a cow sent from Edinburgh. By 30th Sept., 432 cases were reported, and it continued to spread. By the middle of Oct., it was in Mr. Harvey's valuable stock of 800, of which 25 died in one night, and to save further loss, 50 healthy animals were in one day disposed of to the butcher. From Falkirk Trysts, as from Barnet, Norwich Hill, and other large English fairs, the disease was transmitted into fresh localities. From the autumn trysts, it was carried into Perthshire, Forfarshire, and Fifeshire. Diseased cattle passing along in railway trucks, appear to have spread the contagion over the fields adjoining the line at Thornton, Fifeshire. Into West Lothian it was conveyed in early Sept. by lambs from the Edinburgh market.

The rapid spread of the insidious disorder may be gathered from the fact that, whilst, during the week ending 24th June, 1865, there was only one outbreak at Mrs. Nicholl's dairy at Islington, and 30 animals affected, by 30th Sept. there were 1702 farms, sheds, or other places in which the pest had appeared, and 13,263 animals had been attacked. Three months later, 8252 separate places had been visited, and 62,743 animals attacked. During six months, the aggregate of cattle attacked was 76,002. During the three months to 30th Mar., 13,443 farms and other premises had been infected, and 147,275 cattle attacked. In Dec., 1865, the fresh cases each week reached 9000; but in spite of remedial and preventive measures, of orders in council, and restrictions on the movement of stock, the number of weekly cases steadily increased to 15,706 in the third week of Feb. "The cattle diseases prevention act" passed 20th Feb., 1866, and the advantages flowing from the restrictions thus tardily imposed on the trade in cattle, and the slaughter of diseased and infected animals, were speedily apparent. In four weeks, the number of cases was reduced by one half. During the three months ending 30th June, 28,276 cases were reported; during the next three months to 30th Sept., the numbers fell to 2108; whilst, to 29th Dec., the three months' cases were but 149; to 30th Mar., 1867, 89 new cases were noted. Throughout April and May the number of cases continued steadily to decline; but during the week ending 25th May a fresh outbreak occurred in the Finsbury district of the metropolis, and 81 animals died, or were slaughtered to prevent the further spread of the pest. With the exception of an isolated outbreak in Essex, which was promptly stayed by slaughter of the ailing and suspected animals, the country was free of plague during August. The following are the records of its destructive career during 1865–67:

	Attacked.	Killed.	Died.	Recovered.
England.....	223,672	102,740	90,450	21,589
Wales.....	8,388	1,180	5,794	1,117
Scotland.....	46,863	6,263	28,088	10,707
Total...	278,923	110,183	124,332	33,413

To this sad total must be added 11,000 cases known to have been attacked and unaccounted for, and upwards of 60,000 healthy cattle slaughtered to prevent the spread of the disease. Plague was again imported into Hull in Aug., 1872; it was brought with cattle from Cronstadt; it spread into several districts of the East Riding, attacked 72 animals, 51 of which were killed, and 21 died. In 1877, an outbreak took place in Germany, but by energetic measures was speedily suppressed without extensive losses.

Causes.—The development of cattle-plague by filth, overcrowding, miasmata, hot weather, or other such causes, is untenable. Faulty hygiene, by lowering vitality, probably renders the animal more prone to the attack, and less able to bear up against it, but it cannot originate plague. Like hydrophobia, small-pox, or syphilis, it is developed only by the special virus, which appears to have its habitat on the Russian steppes. This virus occurs abundantly in the blood of every plague-stricken beast, in the discharges from its nostrils, mouth, or eyes, in the off-scourings from the bowels, probably even in the breath. It may be transferred to healthy beasts by inoculation. A little of the blood or nasal or other mucous discharges of a plague case, if introduced underneath the skin of a healthy cow, develops the disease within a few days. The transference of the virus or contagion from the sick to the sound animal, is not always so direct and evident. As with other catching diseases, the virus may be carried considerable distances in the air; its particles are minute. but they have powerful vitality; it may adhere to the food that has lain before infected beasts; to the litter from the stalls, or even after it has been heaped for weeks; to the clothes of attendants; to the floors, walls, or stalling of build-

ings; to imperfectly cleansed cattle-trucks. So subtile and potent is the plague poison, and so endowed with the power of self-multiplication and growth, that a very minute portion of it finding access to the blood of a healthy animal of the bovine race increases so rapidly, that to use the words of the commissioners' report, No. III. p. 4, "the whole mass of the blood, weighing many pounds, is infected; and every small particle of that blood contains enough poison to give the disease to another animal." It may gain access to the blood probably through the air-passages, perhaps also by absorption through the mucous surface of the bowels, or even through the skin.

Symptoms.—In from three to six days after an animal has been exposed to the virus of cattle-plague, or about 36 to 48 hours after being purposely inoculated, the temperature of the body is raised by several degrees. A delicate thermometer introduced into the vagina or rectum, instead of marking about 102° F., indicates 104° to 106°. As yet the appetite, secretion of milk, breathing, and pulse are scarcely if at all affected, and but for the elevation of temperature, accompanied sometimes by dullness, the animal might be supposed to be in the best of health. Two or three days later, or usually within six or eight days after the beast has taken in the subtile virus, the mucous membrane of the mouth is generally observed to be slightly reddened, and soon a granular yellowish-white eruption, consisting of thickened epithelium cells and granules, appears on the gums round the incisor teeth, and by and by on the lips and dental pad. Some hours later, the same eruption extends to the cheeks, tongue, and hard palate. Within 48 hours, or about the sixth day of attack, a crust of epithelium covers the gums, lips, and mouth, and when wiped away, or accidentally rubbed off, leaves the abraded membrane red and vascular, and exhibiting patches of erosion. The membrane lining the vagina indicates very similar appearances; it is reddened and vascular, dotted with grayish translucent elevations about the size of rape-seeds, covered with a whitish-yellow, usually sticky discharge, and occasionally marked with patches of excoriation. The skin, like the mucous surfaces, is congested; there is hence a perverted development of scarf skin, and of the oleaginous secretion of the irritated sebaceous glands. The skin is thus invested with a furfuraceous desquamation; whilst on its thinner portions about the lips, between the thighs, and on the udder, there are papular eruptions or elevations. About two, or even three days after the temperature has been increased, and usually one, or even two days after the appearance of the characteristic eruption on the gums, the constitutional symptoms present themselves. The animal is dull, hangs its head, arches its back, the eyes are leaden and watery, and from both eyes and nose there latterly comes a dirty slimy discharge. Appetite and rumination are irregular, and in dairy cows, the secretion of milk rapidly abates. The breathing, especially towards the sixth day, is oppressed, expiration is prolonged, and accompanied by a peculiar grunt. The pulse is small and thready, and quickened as death approaches. The bowels, usually at first confined, become, towards the sixth or seventh day, much relaxed; the discharges passed, often with pain and straining, are profuse and liquid, offensive, acrid, pale colored, and occasionally mixed with blood. The patient loses weight and strength, totters if it attempt to walk, and prefers to lie rather than to stand. Death usually occurs about the seventh day, and is preceded by muscular twitchings, a peculiar sickly, often offensive smell, a cold clammy state of body, moaning, grinding of the teeth, and rapidly increasing prostration.

Prognosis.—Cases usually terminate unfavorably when about the fifth or sixth day the animal temperature falls rapidly; the pulse becomes small, quick, and weak; the breathing more difficult, distressed, and moaning; the diarrhea increased; and the depression more notable. A more favorable termination may be anticipated when, after the fifth day, the heightened temperature, so notable even from the earliest stages, abates gradually; the breathing becomes easier; the pulse firmer; the visible mucous membranes appear healthier; and patches of extravasation or erosion speedily disappear.

Sheep do not take rinderpest spontaneously, and even when kept with diseased cattle, or inoculated with cattle-plague virus, they do not catch the disease so certainly as cattle do. When diseased, they exhibit, however, very similar symptoms, but professor Röll, and other observers, record that upwards of 40 per cent recover. Goats, deer, antelopes, gazelles, yaks, and indeed all animals taking rinderpest, exhibit with tolerable uniformity the same characteristic symptoms.

Post-mortem Appearances.—The mucous membranes are generally deeper colored than natural, are congested, softened, marked in places with the same granular patches discoverable during life within the mouth and the vagina, and in bad cases exhibit œdema, hæmorrhage, and sloughing. The first three stomachs sometimes contain a good deal of food, but show less declension from health than the fourth stomach, of which the mucous membrane is dotted with spots of congestion and extravasation. The coats of the bowels are thinned and easily torn. The mucous coat, especially towards the middle of the small intestines, the opening into the cæcum, and posterior half of rectum, is much congested, bared of epithelium, and sometimes ecchymosed, but never ulcerated. Peyer's glands, so generally inflamed in the somewhat analogous typhoid fever of man, are perfectly healthy. The liver, spleen, and pancreas seldom present any special appearances. The respiratory mucous membrane, like the digestive, is vascular, and marked with submucous hemorrhage; the lungs are generally emphysematous, the heart often marked with petechial spots. The urino-genital, like the other

mucous membranes, is congested in females, especially towards the lower part of the vagina and vulva; the kidneys are sometimes rather softened, the serous membranes and nervous centers are perfectly unchanged. Dr. Beale, by his microscopical observations, discovers in the capillaries a great increase of nuclear or germinal matter, and white blood-corpuscles, which he believes may account for the local congestion. The blood itself is dark in color; in the later stages it contains less water, probably owing to the draining diarrhea, and about double its usual proportion of fibrine. The muscular tissues are softened, easily broken down, and contain an abnormal amount of soluble albumen. The urine is little altered in quantity, but from the first rise in the animal temperature, it contains an increase of urea varying from 5 to 15 per cent. The chief change in the milk is its rapid diminution in quantity, and the increase of its fatty matters. The bile is watery, offensive, and prone to decomposition.

Treatment.—Cattle-plague is proved to be an eruptive fever. When the specific poison, on which such disorders depend, has entered the body of a susceptible subject, no remedy has yet been discovered which can destroy it, or even materially shorten or mitigate its effects. Until such an antidote is found, there can be no hope of certain cure. The cattle-plague commissioners have collected information regarding the four following methods of treatment—namely, the antiphlogistic, the tonic and stimulant, the antiseptic, and the special. Diverse as are these systems, the percentages of recoveries, varying from 25.83 to 27.45, were so nearly alike, that it is fair to conclude that no one of the systems tried exercised any notable influence in checking the mortality. Partly, perhaps, from the varying virulence of the plague, partly from differences in the nursing and care bestowed on the animals, the proportion of recoveries has varied greatly in different localities. Up to the end of 1865, in Huntingdon they were only 4.668 per cent; in Norfolk they were 12.102; in Flint, 15.909; in Scotland, 19.889; whilst in Fifeshire they reached 24.552; and in Yorkshire, 29.731 per cent.

Like small-pox, measles, and other eruptive fevers in man, rinderpest runs a definite course which cannot safely be interfered with. Rational treatment is therefore limited to warding off untoward symptoms, to careful nursing, and husbanding the failing strength. It must, however, be remembered that throughout the progress of the disease there is constantly given off from the sick body minute particles, which are capable of developing the disorder in healthy cattle. Hence plague-subjects, by the orders in council, are very properly desired to be immediately destroyed. Except, therefore, for purely scientific purposes, and with careful precautions to prevent the spread of the poison, it is unwise to attempt remedial treatment. Where, however, a beast is to have a chance of recovery, so soon as the elevated temperature indicates the accession of the disease, solid indigestible food should be withheld, and the patient restricted to mashes, gruel, boiled linseed, malt, and other food, which can be digested without the necessity for rumination. The paramount importance of such a dietary is clearly demonstrated in the returns of the Edinburgh cattle-plague committee to the government commissioners. The recoveries amongst 310 cattle "fed with dry food, and treated medicinally with drugs," were 13.6. Amongst 303 cattle treated with mixed food and hay, 22.2 recovered. Where mashes were given during sickness, but dry food supplied during convalescence, the recoveries reached 51.5; whilst in 95 cottagers' cows, whose chief ordinary dietary consisted of mashed food, and which were fed in the same manner throughout both sickness and convalescence, and were besides carefully nursed but not doctored, the recoveries reached 73.7. Where the bowels at the outset are costive, a dose of oil, or a very small quantity of some saline purgative, may be required. Cold water, gruel, mashes, or stale bread soaked either in water or beer, should be offered at short intervals throughout the attack. The animal, kept in an atmosphere of about 60°, should be comfortably clothed, and have its legs bandaged. The hot-air bath and wet-packing has been repeatedly tried, but although probably useful in the earlier stages, appear, when the disease is fully established; to harass and weaken the patient. Small and repeated doses of sulphite of soda have in some cases proved useful, and may be conjoined with carefully regulated moderate doses of such stimulants as ale, whisky and water, sweet spirit of niter, spirit of ammonia, or strong coffee. It is most important, however, that these and other such medicines should be drunk by the animal of its own accord in its gruel, water, or mashes, as the forcible horning over of drenches always disturbs the patient. The inhalation of chloroform, although temporarily relieving the distressed breathing, does not appear to exert any permanent benefit.

Prevention.—From what has been stated regarding the nature of cattle-plague, it must be evident that its prevention can only be effected by the destruction of the specific virus, or by removing beyond its influence all animals on which it might fasten. Sparks fall harmless where no inflammable materials lie within reach, and there are many such materials. Neither should sheep, fresh hides, hay, nor any other fodder and litter from countries where this ruinous plague exists, or has recently visited, be allowed to enter British ports. This very obvious precaution took strong hold of the public mind, and the practical result is, that importations of cattle-plague are guarded against by the provisions of the contagious diseases (animals) acts, 1869 and 1878. Neither cattle, sheep, nor pigs, fodder, litter, or hides, can be landed from countries where the plague exists, or from places in direct communication with such infected countries. All foreign stock is

inspected at the ports of debarkation, and inspectors have orders for the immediate slaughter and disinfection of cattle-plague subjects, and of any animals with which they have been in contact. But even with such precautions, foreign cattle frequently bring with them catching disorders, notably foot-and-mouth disease. Since they constitute, however, less than 5 per cent of the total cattle stock of the country, such risks should be removed by converting the foreign cattle traffic into a dead-meat trade.

Rinderpest being found to resemble smallpox in men and sheep, it was thought that its propagation and virulence might be abated by vaccination with cowpox lymph; but cattle, even when effectually vaccinated, which is often a difficult task, readily take rinderpest, often in its most mortal forms. Inoculation with the discharges from mild cases and from young calves has been tried as a palliative; but the disease, thus artificially developed, loses nothing either of its severity or of its dangerous contagious character. Cattle in Oxfordshire receiving for several weeks daily doses of sulphite of soda are stated to have had the plague in a mild form.

Where an outbreak occurs, the diseased animals must be promptly destroyed, and all cattle in immediate contact with them should likewise be slaughtered. This "stamping-out system" prevents the multiplication and diffusion of the virus, and hence saves still further losses. It is rigidly and successfully carried out in many continental countries. By stamping out and strict isolation, eight or ten outbreaks in Aberdeenshire were got rid of without serious loss. A French outbreak on the Belgian frontier in Sept., 1865, was stamped out with the sacrifice of forty-three animals. The disease was imported to Paris in Nov. by two gazelles purchased in London by the French Acclimatization society. Before it was stayed by slaughter and segregation, thirty-four animals, including yaks, antelopes, deer, gazelles, goats, and peccari, died or were destroyed. The determined slaughter of diseased and infected animals, and the restrictions on the movement of all stock, were the only means that reduced the number of attacks during the British outbreak of 1865–66. As is officially recorded in the commissioners' report, No. IV., p. 6, "where the percentage of killed is high, the ratio of increase of the disease is low, and *vice versâ*. This has generally been noticed under each county and district."

When plague is in the neighborhood, it is desirable daily to sprinkle the walls, woodwork, and floor of the sheds and hovellings with carbolic acid solution, and to keep up throughout the premises a continual odor of this useful antiseptic, and with a diluted solution of the acid, or with M'Dougall's disinfecting soap, to wash over the cattle daily. The animals should be carefully fed on digestible soft food; receive daily about an ounce of sulphite of soda in a mash; and, in order to note the first access of the disease, should have their temperature examined by the thermometer every night and morning.

The recommendations of the cattle-plague commissioners for the purifying of infected sheds, litter, and manure must receive careful attention. In whatever premises infected beasts have stood, the walls should be lime-washed, a pint of carbolic acid being added to each pailful of the whitewash. The floors and wood-work, after being washed and scrubbed with boiling water, should be sprinkled with a strong solution of carbolic acid. The sheds being emptied of their living inhabitants, and the doors and windows closed, sulphur should be burned, and the vapors allowed to float about for a couple of hours before the sheds are again thrown open to the purifying influences of abundance of fresh air. A pound of sulphur placed on a shovel of burning coals suffices for a twelve-stalled shed or byre. Where cattle plague has raged, this cleaning and fumigation should be repeated, and, if possible, several weeks allowed to elapse before the premises are again occupied by sound animals. All shovels, forks, buckets, or brooms, that have either directly or indirectly come in contact with diseased or infected animals, should be washed with carbolic acid solution. The clothes and boots of attendants, inspectors, and others coming in contact with plague-stricken animals must be similarly cleansed. The manure should be sprinkled with carbolic acid at intervals of a few days, and then covered over with a foot of earth, freely mixed with soil, or carted away and plowed in. It is safer thus to put the manure on the arable land than to use it as a top-dressing for the pastures.

Authorities.—Official reports of commissioners, Nos. I., II., III., and IV.; *The Cattle Plague*, by prof. Gamgee; *Die Rinderpest*, by Roloff (2d ed., 1877); and numerous monographs by German authorities. See *Supp.*, page 890.

CATTO'LICA, a t. of Sicily, in the province of Girgenti, and 14 m. n.w. of the city of that name. It has extensive sulphur-works, and a pop. of 7,200.

CATTY (Malayan, *kati*; Japanese, *kin*), the unit of weight used throughout Chinese and Malayan Asia, and by the Chinese all over the world. American scales exported to Asia are graduated into catties. A catty is 1⅓ pounds avoirdupois.

CATTYWAR. See KATTYWAR, *ante.*

CATUL'LUS, VALE'RIUS, a celebrated Roman lyrist, was b. at Verona, 87 B.C. His father was an intimate friend of Julius Cæsar, and the young poet must have frequently met the great warrior at the paternal residence, when the latter was on his way to Gaul. In early life, he went to Rome, where his career was that of an Epicurean, and the expense of this kind of living soon involved him in pecuniary difficulties. To release

himself from these, he followed the prætor Memmius to Bithynia, with the intention, like his superior, of wringing a fortune out of the provincials. This fashionable but felonious method of acquiring money did not succeed in C.'s case, mainly, however, through the more dexterous cupidity of Memmius. After his return, C. appears to have lived mostly in Rome, and in very straitened circumstances. When he died is unknown. His poems, 116 in number, chiefly consisting of lyrics and epigrams—first brought to light by Benvenuto Campesani of Verona in the beginning of the 14th c.—have always been justly admired for their exquisite grace and beauty of style; but are, in many places, grossly indecent. In higher styles of writing, C. was equally successful, especially in his odes, of which, unfortunately, only four have been preserved. His heroic or narrative poem on the marriage of Peleus and Thetis—consisting of more than 400 hexameter lines—and the wild enthusiastic poem entitled *Atys*, are especially worthy of notice. Most of the earlier editions of C. include the works of Tibullus and Propertius. The best modern editions are by Sillig (1823), Lachmann (1829), and Ellis (1867 and 1878). There are English translations by Lamb (1821), Martin (1861), Cranstoun (1867), etc. See Munro's *Criticisms* (1878).

CAT'ULUS, Quintus Lutatius, d. 87 B.C.; consul of Rome with Caius Marius. Catulus was beaten by the invading Cimbri and driven across the Po, but Marius came to his aid, and the barbarians were defeated at Vercellæ in July, 101 B.C. In the civil war Catulus supported Sulla and was proscribed. Preferring death to capture, he suffocated himself over burning charcoal.

CAT'ULUS, Quintus Lutatius, son of the consul; made consul in 78, and censor in 65, B.C. He put down a rebellion incited by Lepidus after the death of Sulla, and assisted Cicero in the suppression of Catiline's conspiracy.

CAUB, a t. of Nassau, n. Germany, on the right bank of the Rhine, 21 m. w.n.w. of Wiesbaden. It is noteworthy as the place where Blücher crossed the Rhine with his army, Jan. 1, 1814; and also as the place where, till 1866, toll was levied by the duke of Nassau—the only ruler who kept up this feudal privilege—from vessels navigating the Rhine. C. has underground slate-quarries; and opposite, on an island in the river, where Louis le Débonnaire died, 840, is a castle called the Pfalz, built in 1326, and which is said to have been resorted to for safety by the countesses Palatine during their confinement. C. is threatened with destruction by the disintegration of the mountains behind, and in Mar., 1876, a destructive landslip took place. Pop. '71, 2,098.

CAU'CA, a river of the United States of Colombia, in South America, which, after flowing 500 m. to the n.e., joins the Magdalena on the w., 150 m. from the Caribbean sea. It gives name to a department of 260,000 sq.m., and (1870) 445,000 inhabitants.

CAU'CA, one of the United States of Colombia, occupying the whole w. coast of the Caribbean sea to Ecuador, including the chain of the Andes and the valley of the Rio Cauca; 257,462 sq.m. (more than half of the republic); pop. '80, 445,000. The region is well cultivated, producing cereals, sugar, tobacco, coffee, cocoa, cotton, etc., and vast herds of horned cattle and mules. The capital is Popayan.

CAUCAS'IAN VARIETY OF MANKIND, an ethnological division adopted by Blumenbach, which included all the inhabitants, ancient and modern, of Europe (except the Finns); in Asia, the Hindus (of high class at least), Persians, Assyrians, Arabians, Jews, Phœnicians, inhabitants of Asia Minor and of the Caucasus, etc.; and in Africa, the Egyptians, Abyssinians, and Moors. What Blumenbach had called Caucasians, Dr. Prichard, who may be said to have laid the real foundation of ethnology, makes to consist of two independent groups or varieties, grounding on a radical difference of language. One of these is the Syro-Arabian or Semitic (q.v.) race, and the other the Indo-European or Aryan (q.v.) race. The inhabitants of the Caucasus, so long held to be types of the European variety, are now by some excluded from it altogether, and classed with the sallow flat-faced Mongols, to which it is considered the nature of their language and other facts ally them more closely than the symmetry of their shape and complexion do to the European variety. The narrow basis upon which the theory of the Caucasian type was first formed is thus stated by Dr. Latham: "Blumenbach had a solitary Georgian skull; and that skull was the finest in his collection—that of a Greek being the next. Hence it was taken as the type of the skull of the more organized divisions of our species. More than this, it gave its name to the type, and introduced the term *Caucasian.* Never has a single head done more harm to science than was done in the way of posthumous mischief by the head of this well-shaped female from Georgia." See Ethnology

CAU'CASUS, a mountain range of great geographical and ethnographical importance, occupying the isthmus between the Black sea and the Caspian, its general direction being from w.n.w. to e.s.e.—from the peninsula of Taman on the Black sea, in lat. 45° 10′ n., long. 36° 45′ e., to the peninsula of Apsheron on the Caspian, in lat. 40° 20′ n., long. 50° 20′ e.—a length of about 750 miles. The breadth, including the secondary ranges and spurs, may be stated at about 150 m., but the breadth of the higher C. is much less, not much exceeding 60 or 70 miles. This range, formerly belonging entirely to Asia, now forms part of the boundary-line between Europe and Asia. The higher and central part of the range is formed of parallel chains, not separated by deep and wide valleys, but

remarkably connected by elevated plateaus, which are traversed by narrow fissures of extreme depth. The highest peaks are in the most central ridge or chain—Mt. Elburz attaining an elevation of 18,000 ft. above the sea, while Mt. Kasbeck reaches a height of more than 16,000 ft., and several others rise above the line of perpetual snow, here between 10,000 and 11,000 ft. high; but the whole amount of perpetual snow is not great, nor are the glaciers very large or numerous. This central chain is formed of trachyte. The secondary parallel chains are, on the inner side, mostly formed of argillaceous slate and plutonic rocks; on the outer side of limestone. The spurs and outlying mountains or hills are of less extent and importance than those of almost any other mountain-range of similar magnitude, subsiding as they do until they are only about 200 ft. high along the shores of the Black sea. Some parts are entirely destitute of wood, but other parts are very densely wooded, and the secondary ranges, near the Black sea, exhibit most magnificent forests of oak, beech, ash, maple, and walnut; grain is cultivated in some parts to a height of 8,000 ft., while, in the lower valleys, rice, tobacco, cotton, indigo, etc., are produced. As might be expected from the geographical situation of the C., the climate, though it is generally healthy, is very different on the northern and southern sides, the vine growing wild in great abundance on the s., which is not the case on the north. The s. declivity of the mountains, towards Georgia, presents much exceedingly beautiful and romantic scenery.

There are no active volcanoes in Mt. C., but every evidence of volcanic action. There are mud-volcanoes at each end of the range, and there are also famous naphtha springs in the peninsula of Apsheron. See BAKU. Mineral springs also occur in many places. The bison, or aurochs, is found in the mountains; in the forests are many fur-bearing animals; and game abounds. Bears, wolves, and jackals are among the carnivorous animals. Lead, iron, sulphur, coal, and copper are found.

The waters of the C. flow into four principal rivers—the Kuban, and the Rion or Faz (the *Phasis* of the ancients), which flow into the Black sea; and the Kur and the Terek, which flow into the Caspian. The Russians have carried a military road, with great labor and danger, through a valley somewhat wider than most of the Caucasian valleys, between the sources of the Kuban and the Terek. This road passes over a height of about 8,000 ft., and is protected by many forts, but is exposed to other dangers besides those which arise from the hostility of the mountain tribes. The only other road is by the pass of Derbend, near the Caspian sea.

The resistance which the Caucasian tribes, for more than half a century, offered to the arms of Russia, attracted to them the attention of the world. But with the capture (1859) of the prophet-chief of the Lesghians—Schamyl, the most active and determined of the foes of Russia, who for a quarter of a century withstood and harassed the armies sent against him—the power of the Caucasians was greatly shattered; and after his death in 1871 the Russians regarded the territory as virtually subjugated. A large number of the Circassians elected to migrate to Turkish territory, where they were welcomed. The general name Circassians (q.v.) is often, but not very correctly, applied to the tribes which inhabit the Caucasus, and whose whole number is not above 1,300,000 or 1,500,000. From the situation of Mount C., there have gathered together in it tribes belonging to a greater number of distinct races than can perhaps be found within the same space anywhere upon the earth. There are more than 100 different languages or dialects spoken; the Turkish-Tartar language, however, serving for a general medium of communication. The different tribes inhabiting the C., long believed to be the purest type of the Indo-European family, are now considered not to belong to it at all, but to have more affinity with the Mongolian races. See CAUCASIAN VARIETY OF MANKIND. The principal tribes are the Tsherkesses or Circassians, Ossetes, Lesghians, Abchasians, Georgians, Suans, and Tchetches. The Georgians and Ossetes are at least nominally Christians; the Lesghians are fanatical Mohammedans. The Byzantine emperors and kings of Georgia planted Christian churches throughout this region, and many ruins of them remain, some of which are very beautiful. But the present Christianity of the nominally Christian tribes is more akin to heathenism than to true Christianity. In character, they are distinguished by their valor and love of freedom, but also by cruelty and treachery. They carry on a little agriculture, but live more by the care of their flocks, and by hunting.—The Russian lieutenancy of the C., lying on both sides of the mountain range, has an area of 172,170 sq.m., and a pop. (1871) of 4,893,332.

CAUCASUS, INDIAN. See HINDU-KUSH, *ante*.

CAUCHON′, JOSEPH, b. 1816; a Canadian journalist and legislator, prominent in the colonial or Dominion parliament 1844–77. From 1867 to 1872, he was speaker of the senate. He established the *Quebec Journal* in 1842. C. was lieut.-gov., Manitoba, 1877–82.

CAUCHY, AUGUSTIN LOUIS, 1789–1857; a French mathematician; a member of the academy in 1816, and professor of mathematics in the polytechnic school. His reputation rests chiefly upon his residuary and imaginary calculus. In politics he was a firm legitimist, steadily refusing to take the oaths of allegiance from time to time proffered, and on that account resigning his chair of mathematics in the new university of Paris in 1852. He published several valuable works on the calculus, on analysis, and other mathematical themes.

CAUCUS, a meeting, private or public, of eitizens to select eandidates for office; or of members of a legislative body for a similar purpose. Reeently the meaning of the term has been extended to almost any eonference previous to final action. Thus the people may hold a C. to ask or instruct their representative to support one or another measure; or the members of a party in congress, legislature, eommon council, or town-meeting may hold a C. to determine their eourse upon any subject. Legitimately, therefore, the term C. means a preliminary or preparatory meeting to arrange methods for some designated end. Much effort and ingenuity have been spent in trying to settle the origin of the term, but the most probable theory is that it eame from Boston about the middle of the last eentury, and originally meant "the ealkers' meeting," that is, the private gathering of the ship-ealkers. The term was applied almost indiseriminately to meetings in the period preeeding the revolution, and when the federal government was instituted it was aeeepted as the offieial term for what are now called "nominating conventions." Candidates for president of the United States were uniformly seleeted by a C. of the members of congress of the several parties, from 1789 to 1823. In the election of 1824, the regular democratic C. candidate, William H. Crawford, ran behind both Jackson and Adams, and but for some jugglery in New York would have run even behind Clay and come out the lowest of the four. This result ended the congressional C. system of presidential elections, and sinee that time candidates have been nominated by national conventions or political parties. Soon afterwards state conventions supplanted the legislative C. for the nomination of state officers, and now the C. is practieally eonfined to the meetings of partisans in legislative bodies to deeide upon a policy, or to select eandidates for presiding and other offieers of the particular body, or (by joint C. of senators and members of assembly) to settle upon nominees for U. S, senators. Outside of these speeial functions partisan work is now usually managed by eonventions of the party at large, or by smaller conventions of delegates ehosen by the voters of the party, or by eommittees appointed by sueh eonventions.

CAUCUS. See AMERICANISMS.

CAUDEBEC-LÈS-ELBEUF, a t. of France, in the department of Seine-Inférieure, 12 m. s. of Rouen. It has manufactures of cloth, and a pop. of (1876) 11,338.—CAUDEBEC is also the name of a t. in the same department, situated on the right bank of the Seine, 26 m. e. of Havre. It is one of the prettiest and most picturesque little towns on the Seine, with its old wooden houses and elm-shaded quays. It has a fine Gothie ehurch of the 15th e., and manufaetures of eotton, sail-cloth, leather, and soap. Formerly the capital of the Pays de Caux, C. was strongly fortified; and in 1419, so obstinate was its resistanee, that it took the great English gen., Talbot, 6 months to eapture it. Pop. '76, 1951.

CAUDE'TÉ, a t. of Murcia, Spain, 50 m. e.s.e. of Albacete. The inhabitants, 5,500 in number, are chiefly engaged in agricultural pursuits. C. is also the name of a small plaee in New Castile, a few miles from Teruel, where there are some of the largest bone-deposits, fossilized and unfossilized, in Europe.

CAU'DINE FORKS (*Furculæ Caudinæ*), two high, narrow, and wooded mountain gorges near the town of Caudium, in aneient Samnium, on the boundary towards Campania. These gorges are celebrated on account of the defeat here suffered by the Romans in the second Samnite war (321 B.C.). Four Roman legions commanded by the two consuls Titus Veturius and Spurius Postumius, after marehing through a narrow pass, found themselves locked in a spacious valley, surrounded on all sides by lofty mountains, with no way out save that by which they entered, and another pass on the opposite side. Attempting to defile through the latter, they found it blocked up with trees and stones, and eommanded by the Samnites, who had also in the mean time made themselves masters of the other pass. Consequently, the four legions were compelled to eneamp in the valley. After some days, famine compelled them to surrender uneonditionally. The Samnite gen., Caius Pontius, aecording to old custom, eompelled the Romans to pass under the yoke, and then permitted them to mareh baek. This submission was regarded as too ignominious for Rome, and eonsequently the two consuls and the other commanders were delivered again into the hands of the Samnites, who, however, refused to have them.

CAUGHNAWA'GA a village in Canada, 9 m. w. of Montreal, on the s. bank of the St. Lawrence, at the head of the Laehine rapids. It is inhabited exelusively by Indians, remnants of the onee powerful Iroquois. They are about 500 in number.

CAUL is a thin membrane eneompassing the heads of some ehildren when born, and is mentioned here on aeeount of the extraordinary superstitions eonneeted with it from very early ages down to the present day. It was the popular belief that ehildren so born would turn out very fortunate, and that the C. brought fortune to those purehasing it. This superstition was so common in the primitive ehurch, that St. Chrysostom felt it his duty to inveigh against it in many of his homilies. In later times, midwifes sold the C. to advocates at enormous priees, "as an espeeial means of making them eloquent," and to seamen, as an infallible preservative against drowning. It was also supposed that the health of the person born with it could be told by the C., which, if firm and

crisp, betokened health, but if relaxed and flaccid, sickness or death. During last century, it was common to find advertisements in the newspapers of cauls to be sold—from £10 to £30 being the prices asked for them. So recently as 8th May, 1848, there was an advertisement in the *Times* of a C. to be sold, which "was afloat with its late owner thirty years in all the perils of a seaman's life, and the owner died at last at the place of his birth." The price asked was six guineas. Sir John Offley, of Madeley manor, Staffordshire, by his will, proved at Doctors' Commons 1658, devised a C. set in jewels, which had covered him when he was born, to his daughter, thereafter to her son, and then to his own heirs-male. The C. was not to be concealed or sold out of the family. See Brand's *Popular Antiquities*, vol. iii.; *Notes and Queries*, 1st series, vol. vii.

CAULAINCOURT, Armand Augustin Louis de, duke of Vicenza, a statesman of the French empire, was b. at Caulaincourt, a village in the department of Somme, Dec. 9, 1772. He entered the army at the age of fifteen, rapidly attained promotion, and, as col. of a regiment of carbineers, distinguished himself in the campaign of 1800. He was made a gen. of division in 1805, and shortly after created duke of Vicenza. In 1807, he was appointed ambassador at St. Petersburg, where he soon gained the confidence of the czar, who often made use of his advice. Disputes having arisen between Alexander and Napoleon, C. endeavored to restore amity and prevent war; but his proposals being rejected, he, in 1811, asked permission to resign his post, and received an appointment in the army of Spain. During the events of 1813, he was frequently employed as plenipotentiary in diplomatic affairs. In Nov. of 1813, he was made minister for foreign affairs, and in this capacity attended the congress at Chatillon, Jan., 1814. When Napoleon abdicated, C. endeavored to make use of his influence with Alexander to obtain the most favorable conditions for the fallen emperor, and, chiefly through his intervention, the island of Elba was ceded to Napoleon. During the hundred days, C. resumed office as minister of foreign affairs, and was made a peer. On the second restoration, he retired into private life. He died in Paris, Feb. 19, 1827. —His brother, August Jean Gabriel, count of Caulaincourt, b. 1777, served with distinction in all the campaigns from 1792 to 1812, when he fell in battle.

CAULIER, Madeleine, a peasant girl of France who aspired to the military fame of the maid of Orleans. At the siege of Lille, in Sept., 1708, she conveyed into the city an important order to the officer in command, for which the duke of Burgundy offered her a large reward. This she declined, but received permission to raise a company of dragoons. She was killed in the battle of Denain, July 24, 1712, when marshal Villiers defeated the imperialists.

CAULIFLOWER, a variety of the common kale or cabbage, affording one of the most esteemed delicacies of the table. It was cultivated as a culinary vegetable by the Greeks and Romans. Its culture was, however, little attended to in England till the end of the 17th c.; but after that time it rapidly increased, and prior to the French revolution, C. formed an article of export from England to Holland, whilst English C. seed is still preferred on the continent. The C. is entirely the product of cultivation. The leaves are not in this, as in other varieties of the same species generally, the part used, nor are they so delicate and fit for use as those of most of the others, but the flower-buds and their stalks, or, properly speaking, the inflorescence of the plant deformed by cultivation, and forming a head or compact mass generally of a white color. There are many subvarieties, but all of them are rather more tender than the ordinary forms of the species, and in Britain generally require more or less protection during winter, whilst the seed is sown on hotbeds, that the plants may be ready for planting out in spring. Later sowings are made in the open ground. The C. requires a moist rich loamy soil, with abundance of manure, and above all, very careful cultivation, which is directed to the object of having the heads not merely large, but as compact of possible. Great care is bestowed on the selection of proper plants for seed. In Scotland, C. plants almost always require the protection of the frame during winter. C. may be preserved for some time fit for use by pulling the plant up by the roots, and hanging it in a cold and dry place.—Broccoli (q.v.) may be regarded as another kind of cauliflower.

CAULKING is the operation of driving oakum or untwisted rope into the seams of a ship, to render them water-tight. The quantity thus driven in depends on the thickness of the planking; it varies from 1 to 13 double threads of oakum, with 1 or 2 single threads of spun-yarn. The caulker first *raims* or *reems* the seam—that is, drives a caulking iron into it, to widen the seam as much as possible, and close any rents or fissures in the wood; he then drives in a little spun-yarn or white oakum with a mallet and a kind of chisel, and afterwards a much larger quantity of black or coarse oakum. The fibers are driven in until they form a densely hard mass, which not only keeps out water, but strengthens the planking. The seam is finally coated with hot pitch or resin.

CAULO'NIA, an ancient Greek city in Italy near the gulf of Syllacium. It was a town of importance five centuries before Christ. In 389 B.C. it was captured by Dionysius the elder who removed its people to Syracuse. Porphyry asserts that Pythagoras sought refuge in Caulonia after his expulsion from Crotena.

CAULOP'TERIS, a generic name for the stems of fossil tree-ferns found in the carboniferous and triassic measures. They are hollow, and covered with the markings similar to the leaf-scars on recent tree-ferns. Twelve species have been described.

CAUS, or CAULX, Salomon de, 1576–1630; a French engineer and physicist who resided in England and in Heidelberg, and later in Paris. Little was known of him until Arago exhumed his works, from which he considered him to have been the real inventor of the steam engine, for in one of these works he gave the plan of an apparatus for raising water by the power of steam. Some critics believe that it was from Caus that the marquis of Worcester got the idea, printed in his *Century of Inventions* in 1633, of the "exact and true deposition of the most stupendous water-commanding engine, invented by the right honorable Edward Somerset, lord marquis of Worcester."

CAUSE. The words "Cause," "Causality," and "Causation," although familiar and intelligible in ordinary speech, have given rise to some of the most subtle questions in philosophy and theology. We shall here advert briefly to the chief meanings of these terms, and in so doing, we shall indicate the disputes that have arisen in connection with them.

In common language, we are accustomed to describe as the C. of an event, the one event immediately preceding it, and but for which it would not have happened. A man slips his foot on a ladder, falls, and is killed: we give the slipping of the foot as the C. of the fatality. A legislative assembly decides a question of great moment by the casting vote of the president, who is then not unfrequently spoken of as the C. of all the good or evil that followed on the decision. Now, a slight examination shows that this mode of speaking is defective, as not expressing the whole fact, or, in other words, presumes a great deal that is not stated. In the supposed death from a fall, there are many conditions necessary to the result besides the slipping of the foot: the weight of the body, the height of the position, the hardness of the ground, the fragility of the human frame, all enter into the C. strictly represented; but for practical purposes, we leave out of account all those elements that are not at the moment under our control, and allude to the one that is so. And when we speak of the decision of an assembly being the effect of the president's vote, we mean that his share in the responsibility is peculiarly great, or that, in order to turn the vote in one way, all that is necessary is to secure his individual opinion. If we do not enumerate all the conditions of the event, it is because some of them will, in most cases, be understood without being expressed, or because, for the purpose in view, they may without detriment be overlooked

When, however, we aim at strict accuracy, as in the investigations of science, we must not be content with singling out the one turning event, but must enumerate everything that is necessary to the result. A *scientific C.* is the full assemblage of *conditions*, failing any one of which, the effect would not happen. In a full explanation of the phenomenon of the tides, we must enumerate all the circumstances connected with their production—the attraction of the sun and moon, the motions of the earth and the moon in their orbits, the globular form and rotation of the earth, the liquidity of the sea, the mode of distribution of the sea over the earth—every one of which facts is an essential in the full causation. The effect cannot be adequately accounted for without adverting to every one of those conditions, and it is therefore the sum-total of them that is rightly described as the C. of the tides. Taking this complete view of causation, it is found that every event that happens is the sequel to some previous event, in whose absence it would not have been, but which being present it is sure to occur. Between the phenomena existing at any instant, and the phenomena existing at the succeeding instant, there is an invariable order of succession; to certain facts, certain facts always do, and, as we believe, will continue to succeed. The invariable antecedent is termed the C.; the invariable consequent, the effect. What is termed the *law of universal causation*, consists in this, "that every consequent is connected in the manner now described with some particular antecedent, or set of antecedents."—Mill's *Logic*, book iii. chap. 5.

The physical philosopher—the chemist or physiologist—trusts to the uniformity with which the same C. yields the same effect; and if he can find out the true succession in one instance, he is satisfied that the same succession will always hold. In the physical sciences, therefore, there is no dispute as to the law of causation itself; the controversies on that head occur only in *metaphysics*. It is made a serious problem by mental philosophers, and also by theologians, to determine how we come by the irresistible belief that we are said to possess, that every event has and must have a cause. There are many answers to this question: *eight* are enumerated by sir William Hamilton (*Discussions on Philosophy*, p. 611, 2d edit.). It is only necessary, however, to advert to the two radically opposite points of view from which the subject is now surveyed.

The one view is, that we have an instinct or *intuition* of the mind by which we are compelled to recognize this law, so that to us it is a necessary truth, which we cannot escape from if we would. Our experience of the outer world, doubtless, shows us that things follow one another in an orderly and uniform manner, that the stone that sinks in water to-day does not float to-morrow, but no experience could give us the sense of commanding necessity that we have of the law of C. and effect. "Causation is not the mere invariable association of antecedent and consequent; we *feel* that it implies

something more than this." The philosophers who maintain this side give forth two different affirmations; the *one*, that we actually possess an intuitive belief of necessary causation; the *other*, that our possession of the belief is a sufficient proof that the law actually pervades the universe. Experience operates to confirm us in those instinctive tendencies, but no amount of experience would have been able to create them.

The latest modification of the theory that ascribes our belief in causation to an intuition of the mind, is the doctrine promulgated by sir W. Hamilton, to the effect that "we are unable to think that the quantity of existence, of which the universe is the conceived sum, can be either amplified or diminished. We are able to conceive, indeed, the creation of a world; this, in fact, as easily as the creation of an atom. But what is our thought of creation? It is not a thought of the mere springing of nothing into something. On the contrary, creation is conceived, and is by us conceivable, only as the evolution of existence from possibility into actuality, by the fiat of the Deity. And what is true of our concept of creation, holds of our concept of annihilation. We can think no real annihilation—no absolute sinking of something into nothing."—*Discussions*, p. 619. Thus, every effect must have a C., and every C. must have its effect, because, if it were not so, there would be either a pure creation or a pure annihilation, neither of which, according to sir W. Hamilton, is thinkable or conceivable by the human mind. This doctrine, however, has not found acceptance even by those who, if not actual disciples of the author, are most disposed to receive his philosophy generally, as may be seen by referring to prof. Fraser's *Essays in Philosophy*, p. 170; M'Cosh *On the Divine Government*, p. 529, 4th edition; and Mansel, art. metaphysics, *Encyclopædia Britannica*. So far from the creation or annihilation of matter or force being inconceivable, it may be said with truth that until the end of last century it was not known as a fact that the materials of the globe are absolutely indestructible. The effects of combustion and evaporation could hardly suggest anything else than the annihilation of a certain portion of material. Combustion merely transformed the material consumed into other shapes, nothing being absolutely lost. So much for ponderable matter. As regards force, or moving power, the demonstration that this is never absolutely lost, even on the many occasions when it is so to all appearance, is a still later result of laborious scientific inquiries, being, in fact, one of the conclusions arrived at within the last few years. See FORCE. To represent, therefore, one of the latest achievements of experimental science as a primitive intuition of the human mind, is to violate, in the strongest manner, our sense of propriety and consistency.

As opposed to the intuitional doctrine of causation, we have a variety of views by Hume, Dr. Thomas Brown, and others, which need not be specified in detail. One may be given as an example. It has been seen that there are two affirmations in the theory just discussed; that the mind possesses an intuitive belief of causation, and that the possession of this belief is evidence of the existence of the law. Now, one or both of these affirmations may be denied; and the *denial* of either, by even a small minority of the human race, is held to be fatal to the theory, because *unanimity* is essential to the establishment of a universal instinct. Now, many men may possess an instinctive belief in the necessity of a cause to all effects, and of an effect to all causes; some, it is affirmed, do not; it cannot, therefore, be a universal or essential part of human nature.

In like manner, the second affirmation—namely, that the possession of an instinctive belief is a proof of the truth of the thing believed—is denied, on the ground that our instincts often dispose us to believe things that experience shows to be untrue. We have a strong natural tendency to believe in the universality and continuance of the exact order of things that we are ourselves born into, and are only put right by seeing the contrary. "A mere disposition to believe, even if supposed instinctive, is no guarantee for the truth of the thing believed. If, indeed, the belief ever amounted to an irresistible necessity, there would be then no *use* in appealing from it, because there would be no possibility of altering it. But even then the truth of the belief would not follow: it would only follow that mankind were under a permanent necessity of believing what might possibly not be true; just as they were under a temporary necessity—quite as irresistible while it lasted—of believing that the heavens moved, and the earth stood still. But, in fact, there is no such permanent necessity. Many of the propositions of which this is most confidently stated, great numbers of human beings have disbelieved. The things which it has been supposed that nobody could possibly help believing, are innumerable; but no two generations would make out the same catalogue of them."—Mill's *Logic*, book iii. chap. 21. Mr. Mill and others hold that the proof of the law of causation rests exclusively on the uniform and growing experience of the human race. This, however, is not inconsistent with our possessing the natural instinct above alluded to, by which we are led to suppose that what is will continue, and what has been will be repeated; an instinct that *coincides*, to a certain extent, with the law of C. and effect, and is therefore a predisposition on our part to accept what experience teaches on this head. It is only maintained that the instinct is of itself *no proof*, although useful in so far as it prepares us for what there is real evidence for believing. By yielding to the instinct in its crudest shape, the inhabitant of the tropics scouts the idea that water can ever be solid; the African would deny the existence of white men; and even an intelligent European could not be persuaded that any metal would float. Experience must correct the instinctive tend-

encies, otherwise no reliance can ever be placed upon them; by which we acknowledge it as the sole test of truth, while intuitive dispositions are no test whatever.

Even those who maintain the instinctive necessity of the conviction we are discussing, admit two great exceptions—viz., the existence of a FIRST C., itself uncaused, and the liberty of the will, or the exemption of human actions from the rule that applies so strictly to physical nature.

It is further contested between the two opposite schools of philosophy, whether or not MIND be the sole ultimate C. of all phenomena, as it is the C. most familiar to us—namely, the source of our voluntary exertions. On one side, it is affirmed to be "inconceivable that dead force could continue unsupported for a moment beyond its creation. We cannot even conceive of change or phenomena without the energy of a mind." "The word action has no real significance, except when applied to the doings of an intelligent agent." "Phenomena may have the semblance of being produced by physical causes, but they are in reality produced by the immediate agency of a mind; if they do not proceed from the human, they are the result of the divine will." To this it is replied, that we are here taking for granted that every kind of power is analogous to that which we happen to be first acquainted with; but it is a pure assumption without proof or relevance, to suppose that all modes of energy must conform to this one type. Mill, book iii. chap. 5. It is further pointed out that even in ourselves, pure mind, or mind acting by itself, is not known to be an efficient C.; it must be mind together with body. The laborer cannot sustain a day's toil merely because of his *wish* to do so; he must be fed, and rested, and have all his bodily organs in good condition, in order to do his work. The human system, when employed as a prime mover, can no more dispense with the material conditions, than a steam-engine can work without coal, or when out of repair.—Bain *On the Emotions and the Will*, p. 472.

The subject of causation was very particularly studied by Aristotle. He enumerated four different kinds of causes, which have ever since had a place in philosophy. These are the *material*, the *formal*, the *efficient*, and the *final*. The first, or *material*, is what anything is made of; brass or marble is the material C. of a statue. The *formal* is the form, type, or pattern according to which anything is made; the drawings of the architect would be the formal C. of a house. The *efficient* is the power acting to produce the work, the manual energy and skill of the workmen, or the mechanical prime mover, whether that be human or any other. The *final* C. is the end or motive on whose account the work is produced, the subsistence, profit, or pleasure of the workman. Aristotle mentions the case of a physician curing himself, as exemplifying all the causes in one and the same subject. It is obvious that these are what we should now term the aggregate of *conditions* necessary to the production of any work of man; it being essential that there should be a motive for the work (final), a material to operate upon (material), a plan to proceed by (formal), and an exertion of energy to do what is wanted (efficient). When nature is viewed as the result of a creative mind, these causes are considered as inhering in the Divine contriver.

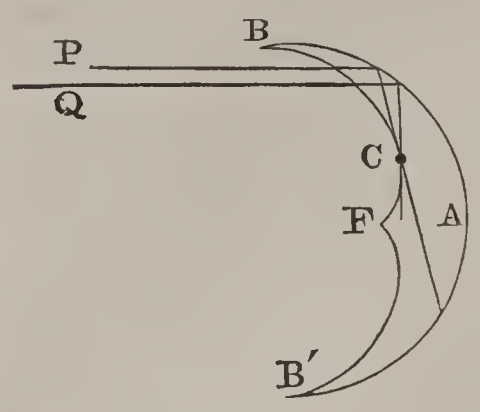
In popular language, C. is held as identical with *explanation*. In other words, when a phenomenon which we are puzzled to account for is explained to our satisfaction, we say that we know its cause, but we often seek for, and are satisfied with, explanations that have no value in the view of science; and on the other hand, refuse to rest content with such as are scientifically valid. People occasionally insist on knowing the C. of gravity itself, something deeper than the discovery of Newton, and whatever explanation satisfies the mind, would be accepted as the cause. Sometimes a theological explanation is offered, and at other times, a metaphysical necessity is put forth.

CAUSTIC (Gr. burning), in medicine and in chemistry, is the term applied to such substances as exert a corroding or disintegrating action on the skin and flesh. *Lunar C.* is nitrate of silver, and *common C.* is potash. When used as a C. in medicine, the substance is fused and cast into molds, which yield the C. in small sticks the thickness of an ordinary lead pencil, or rather less.—*C.* is also used in chemistry in an adjective sense—thus C. lime, or pure lime (CaO), as distinguished from mild lime, or the carbonate of lime (CaO,CO_2), C. magnesia (MgO), and mild magnesia (MgO,CO_2), etc.

CAUSTIC, CATACAUSTIC, and DIACAUSTIC. In optics, C. is the name given to the curved line formed by the ultimate intersections of a system of rays reflected or refracted from a reflecting or refracting surface, when the reflection or refraction is inaccurate. When the C. curve is formed by reflection, it is called the catacaustic—sometimes simply the C.; when formed by refraction, it is called the diacaustic curve. In mathematical language, a curve formed by the ultimate intersections of a system of lines drawn according to a given law is called the *envelope*, and is such that the lines are all tangents to it. As in a system of rays reflected or refracted by the same surface *all* follow the same law, it follows that the C. is the envelope of reflected or refracted rays.

An example of the catacaustic is given in the annexed figure for the case of rays falling directly on a concave spherical mirror, BAB', from a point so distant as to be practically parallel The curve may be said to be made up of an infinite number of points, such as C, where two very near rays, such as P, Q, intersect after reflection. This catacaustic is an epicycloid. The curve varies, of course, with the nature of the

reflecting surface. In the case represented in the figure, the cusp point is at F, the principal focus. No such simple example can be given of the diacaustic curve as that above given of the catacaustic. It is only in the simplest cases that the curve takes a recognizable form. In the case of refraction at a plane surface, it is shown that the diacaustic curve is the evolute either of the hyperbola or ellipse, according as the refractive index of the medium is greater or less than unity.



The reader may see a catacaustic on the surface of tea in a tea-cup about half full, by holding the circular rim to the sun's light. The space within the caustic curve is all brighter than that without, as it clearly should be, as *all* the light reflected affects that space, while no point without the curve is affected by more than the light reflected from half of the surface.

CAUTERETS', a watering place in Hautes-Pyrénées, France, 26 m. from Tarbes. It is in a basin 3,254 ft. above tide, and is noted for its many hot sulphur springs ranging from 102° to 140° F. Pop. 1300.

CAUTERY. See Bleeding, and Moxa, *ante*.

CAUTION, in the law of Scotland, like guaranty (q.v.) in England, is an obligation undertaken by a second party, whereby he binds himself, failing the primary obligant, to fulfill his obligation, whether it be of a pecuniary nature or otherwise. Cautionary obligations, like engagements of guaranty, are thus essentially of a secondary nature; and, previous to the passing of the mercantile law amendment act (19 and 20 Vict. c. 60), it was customary in Scotland to distinguish between what was called *cautionary proper*, where the cautioner was bound avowedly as such, and *improper cautionary*, where both cautioner and principal were bound as principals. Since this period (1856), however, cautionary proper has ceased to exist otherwise than as the result of positive stipulation, under the saving clause attached to the eighth section of the statute referred to, which enacts that "nothing herein contained shall prevent any cautioner from stipulating, in the instrument of C., that the creditor shall be bound, before proceeding against him, to discuss and do diligence against the principal debtor." Cautionary obligations are generally gratuitous, being, for the most part, undertaken from motives of friendship; but it is by no means uncommon for them to be entered into in consideration of a premium paid by the person guaranteed, or by those interested in his fortunes. The existence of such a consideration has always been optional in Scotland, and this rule has recently been adopted in England (19 and 20 Vict. c. 97, § 3). Where a premium is paid, the transaction becomes a mere insurance of solvency, honesty, or efficiency; and associations of great public utility (see Guarantee Association) have been formed, both in England and Scotland, for the purpose of undertaking, as a speculation, to guarantee the good conduct of persons employed either in public or private offices of trust. The tendency of judicial decisions, both in England and Scotland, for many years past, has been to require greater strictness than formerly in the constitution of cautionary obligations; and latterly, the legislature itself has stepped in with the same object in view. By the statute which we have already quoted, it is enacted that all such engagements shall be in writing, subscribed by the person undertaking or making them, or by some person duly authorized by him, otherwise they shall have no effect. If a cautionary obligation is dependent on a condition, it will, of course, be ineffectual unless the condition be complied with. The cautioner may, in general, plead every defence which was competent to the principal debtor, and the extinction of the primary obligation extinguishes the secondary one. The discharge of one cautioner, moreover, unless consented to by the rest, is a discharge to all. Cautioners bound subsequent to the passing of the act mentioned, have, in consequence of the eighth section already referred to, no right to what in Scotland was called discussion (q.v.); but those bound prior to that act are entitled, as formerly, to require that the creditor shall first call on the principal debtor, and compel him to pay in so far as he is able, or in law language, *discuss* him. The cautioner is entitled, on payment of the obligation, to an assignation of the debt and diligence, by which means he comes, in all respects, into the creditor's place; and, moreover, if the solvency or other conditions of the principal debtor should seem precarious, he may adopt legal measures for his relief. Co-cautioners, or persons bound together, whether their obligations be embodied in one or several deeds, are entitled to mutual relief. But, where a co-cautioner obtains relief from the others, he must communicate to them the benefit of any deduction or ease which may have been allowed him in paying the debt.

Cautionary obligations are often undertaken in behalf of persons in situations in which the engagements and liabilities are prospective. In order that such obligations may be binding, the nature and extent of the liability must be fairly and fully disclosed to the cautioner. But while the cautioner must not be exposed to the danger arising from any transaction not in his view in entering into the contract, he is not entitled to withdraw without due notice and a reasonable time being given for entering into a new arrangement. The question whether the effects of a bond are prospective, or retrospec-

tive merely, will depend on its terms; the *presumption*, where these are in any way doubtful, being always in favor of the latter alternative. The creditor is bound to exercise a certain degree of vigilance over the conduct and circumstances of the person guaranteed, and not to permit any very gross departure from the terms of the contract, to the prejudice of the cautioner. Should this obligation be neglected, the cautioner will be freed from his obligation.

CAUTION, for a cash credit. See CASH ACCOUNT.

CAUTION, JUDICIAL, in the law of Scotland, is of two kinds—for appearance, and for payment. If a creditor makes oath before a magistrate, that he believes his debtor to be meditating flight (*in meditatione fugæ*), he may obtain a warrant for his apprehension; and should he succeed in proving the alleged intention to flee, he may compel him to find C. to abide the judgment of a court (*judicio sisti*). The second kind of judicial C. is by *bond of presentation*, which is granted when the creditor is about to execute personal diligence, or has done so, and the cautioner, on condition of an indulgence to the debtor, binds himself that the debtor shall be forthcoming at the appointed time, otherwise he himself will pay the debt. The object of this form of C. is simply to protect the debtor from imprisonment, and allow him time.

CAUTION, JURATORY. See POOR'S ROLL, and 13 and 14 Vict. c. 36, § 34.

CAUVERIPU'RAM, a t. of the district of Coimbatoor, in the presidency of Madras, on the right bank of the Cauvery, in lat. 11° 54′ n., and long. 77° 48′ east. It takes its name from the neighboring gorge of 30 m. in length through the eastern Ghauts, along which the Cauvery finds a passage. Pop. of C. (or *Kaveripuram*) in 1871, 6,532.

CAU'VERY, or KAVERI, a river in the s. of Hindustan, rising in Curg, and flowing through Mysore and Madras, with a course of 472 m., into the bay of Bengal by various mouths. Its delta, with a coast of 80 m., and a depth of 70, lies almost wholly in the district of Tanjore. The C. is peculiarly available for irrigation; and for improving it in this respect, a grant of £50,000 was sanctioned in 1841. During the rainy season, the stream is navigable for small-craft.

CA'VA, LA, a t. of Italy, in the province of Salerno, 3½ m. n.w. of the town of Salerno. It is a flourishing place, with manufactures of silk, cotton, linen, and pottery. Pop. 6,397. About a mile from C. is the celebrated Benedictine monastery of the Trinity, with its magnificent archives, containing 60,000 MSS. and 40,000 parchment rolls. Its library, at one time also rich in MSS. and rare printed books, has been dispersed. In the monastery church are the tombs of queen Sibilla and of various anti-popes.

CAVAIGNAC, ELÉONORE LOUIS GODEFROY, 1801–45; a journalist of Paris, son of Jean Baptiste. He was an opponent of Louis Philippe and one of the prominent founders of the "Societe des Amis du Peuple," and of the "Societe des Droits de l'Homme." He was often arrested and sometimes imprisoned, but escaped in 1835 and went to Belgium. In 1841, he returned to Paris and became one of the editors of the *Reforme*, the ablest of the opposition newspapers.

CAVAIGNAC, LOUIS EUGÈNE, was b. in Paris, 1802, and was educated in the Polytechnic school, and the *Ecole d'Application* at Metz. He first served in the Morea, and afterwards in Africa (whither he was sent in 1832 into a kind of honorable exile, in consequence of a too free expression of opinion in favor of republican institutions), where he acquired great distinction by his energy, coolness, and intrepidity. He was made chef de bataillon in 1837, and rose to the rank of brigade-gen. in 1844. In 1848, he was appointed governor-general of Algeria, but in view of the impending revolutionary dangers, was called to Paris, he having also been elected as a delegate to the national assembly by the two departments of Lot and Seine. In the insurrection of June which followed, C., as minister of war, had a most difficult task to play, and he displayed, during the four days and nights of the contest, remarkable presence of mind, firmness, and activity. His plan of action appeared strange and almost traitorous at the time. In opposition to the wishes of the national assembly, who desired that the troops should be dispersed over Paris, he divided his men into three separate bodies, which had to clear their several routes from obstacles in order to effect a reunion, streets and even quarters of the city being left for some time without military protection. Regarding the outbreak more as the beginning of a civil war than a mere insurrection, he, in fact, met the insurgents in true order of battle. His operations were successful, and his clemency was as remarkable as his generalship. When he had the power of assuming the dictatorship, he resigned it into the hands of the national assembly, which appointed him president of the council. As a candidate for the presidency of the republic, when Louis Napoleon was elected, he received about a million and a half of votes. On the *coup d'état* of Dec., 1851, C. was arrested, but released after a short detention; and though he consistently refused to give in his adhesion to the empire, he was permitted to reside in France without molestation. He died very suddenly of heart disease in Oct., 1857, at his country-house near Tours, and was buried in the cemetery of Montmartre, Paris, in presence of many thousand spectators, including several republican leaders. In debates, C. was remarkably unlike his countrymen, being not voluble and declamatory, but sober, clear, and moderate.

CAVAILLON, a t. and important railway junction in Vaucluse, France, 13 m. s.e. of Avignon. It is a poorly built and dirty place, but has a fine town-house, an old church of the 12th c., and the remains of a triumphal arch of about the time of Constantine; other relics of the Roman period are found in the neighborhood. There is considerable trade in dried fruits, madder, and the agricultural productions of the fertile region around. Pop. '72, 3,906.

CAVALCAN'TI, Guido, d. about 1300; an Italian poet and philosopher, the son of the philosopher whom Dante pictured in torment among the Epicureans and Atheists—but himself a friend of the great poet. By marriage C. became the head of the Ghibellines, and, after some years, was banished with the other leaders, and died in exile. His poems are chiefly in honor of a French lady by him called Mandetta. He also wrote on philosophy and oratory.

CAVALIER, in fortification, is a defense-work constructed on the *terre-plein* or level ground of a bastion. It rises to a height varying from 8 to 12 ft. above the rampart, and has a parapet about 6 ft. high. Its uses are to command any rising ground held by the enemy, within cannon-shot; and to guard the curtain, or plain wall between two bastions, from being enfiladed. For these purposes, it mounts heavy ordnance. It may be either curved, or bounded by straight sides.

CAVALIER (Fr. *chevalier;* Ital. *cavaliere;* Span. *caballero,* probably from the Latin *caballus,* a horse), originally meant any horse-soldier, but in English history is the name given to the party which adhered to king Charles I., in opposition to the roundheads (q. v.) or friends of the parliament.

CAVALIER', Jean, 1680–1740; a native of lower Languedoc, in southern France; the famous chief of the Camisards (who in some particulars seem to have been the precursors of the English and American shakers). He was a peasant's son, and was employed in sheep-keeping, afterwards as apprentice to a baker, and within that period trained by a pious Protestant mother. He was driven from his native place by the pitiless persecution of Protestants that followed upon the revocation of the edict of Nantes, and took refuge in Geneva. The murderous dragonnades of Louis XIV. drove the Protestants of the Cevennes at last to revolt, and C., inspired with the hope of being their deliverer, returned in 1702 to his own country, where he became one of the chosen leaders of the insurrection, which broke out in July of that year. It was Roland who was put in chief command, but C. soon rose to be his equal, and, though untrained in arms, he displayed not only fiery courage, but extraordinary military skill. Although these "children of God," as the insurgents were called, numbered at the most not more than 3,000 men-at-arms, they coped successfully again and again with the far greater forces of the king, and were never entirely conquered. After several conflicts, C. changed the seat of the war to the Vivarais; and Feb. 10, 1703, defeated the royal troops at Ardeche; but only a few days later he was completely defeated on the same ground, and was supposed to have fallen. He reappeared, however; was again defeated at Tour-de-Bellot; and again recovered himself, recruits gladly flocking to his standard to take the places of the slain. By a long series of successes he raised his reputation to the highest pitch, and gained the full confidence of the people. The harshest measures were tried in vain against the Camisards; their mountain retreat was invaded by the Roman Catholics, and their houses sacked and burned; but C. retaliated in kind, invaded the region of the plains, and even threatened the city of Nismes. April 16, 1704, he encountered marshal Montrevel at the bridge of Nages with 1000 men against 5,000, and, although defeated, managed to retreat with two thirds of his forces. Marshal Villiers was next sent against him, but proposed to negotiate instead of fighting. Roland refused to listen, but C. agreed to treat, and did so, the result being that C. received for himself a commission and a pension of 1200 livres, and for his brother a captain's commission. C. was authorized to raise a regiment of Camisards to be sent to Spain, and liberty was given to his father and other Protestant prisoners. This treaty, which did not include any provision for general liberty of conscience, excited great indignation among the companions of C., who called him coward and traitor, and deserted him. He was greatly disheartened at this treatment, and soon afterward visited the king in Paris, by whom he was coldly received. These disappointments and rebuffs, together with stories current of probable attempts upon his life, impelled him to leave France. He went to Switzerland, and then to Holland, where he married a daughter of Mme. Dionoyer, a lady of Nismes, who had once been sought in marriage by Voltaire. C. then went to England to recruit his regiment of Camisards, and had an interview with queen Anne, who sent him with his regiment to Spain under the earl of Peterborough and sir Cloudsley Shovel, in May, 1705. At the battle of Almanza his Camisards encountered a French regiment which they had met in the Cevennes, and, without firing, both bodies rushed upon each other in a fierce hand to hand fight, and made a fearful slaughter, C. being severely wounded, but saved from death by an English officer. Long after his return to England he was made a maj.gen., and governor of Jersey; and finally governor of the Isle of Wight. He died at Chelsea, where he was buried. See Camisards.

CAVALLER-MAGGIO'RE, a t. of n. Italy, in the province of Cuneo, 24 m. n.e. of Coni. It was formerly fortified and defended by two castles, but of these there is now hardly a vestige remaining. It is a busy place, with a pop. of 5,300.

CAVALLI'NI, PIETRO, 1259–1344; a Roman artist taught by Giotto, whom it is believed he assisted in the mosaic of the ship of St. Peter, in the porch of St. Peter's church. He was also an adept at painting, and his grand fresco of the crucifixion at Assisi is still in tolerable preservation.

CAVALRY is a general name for horse-soldiers or troopers. The subdivisions are very numerous; such as guards, dragoons, lancers, hussars, cuirassiers, mounted rifles, etc. The C. force of the British army is usually divided into *household* and *line*. The numbers voted for 1881–82 were:

	Household cavalry.	Line cavalry, home service.	Line cavalry in India.
Officers	75	506	207
Non-commissioned officers	168	1,027	369
Rank and file	1,053	9,553	3,726
	1,296	11,086	4,302

The difference between the household C. and the line is this: The former belong to the *guards*, a specially favored body of troops; while the latter comprise all who are *not* guards. The regiments are 31 altogether. During more than half a century, the number was 26; but in 1858, two new regiments were created—to restore the 5th and 18th dragoons, which had been struck out of the army list in 1799 for disloyalty in the Irish rebellion; and in 1862, 3 regiments were taken over from the abolished local European army of India. The list comprises 2 regiments of life guards (red), 1 of horse guards (blue), 7 of dragoon guards, and 21 of dragoons. Of these last-named 21 regiments, the 1st, 2d, and 6th are simply called dragoons; the 5th, 9th, 12th, 16th, and 17th, lancers; the 3d, 4th, 7th, 8th, 10th, 11th, 13th, 14th, 15th, 18th, 19th, 20th, and 21st, hussars. A distinction is often made between *heavy* and *light* C.; and, in continental armies, this distinction is very marked; but in England, the men and horses are not selected with much reference to this matter; the heavy being often too light, and the light too heavy, to correspond with their designations. In so far as the distinction holds in the British army, the dragoon guards, horse guards, and life guards are classed and equipped as heavy C., the dragoons medium, and the lancers and hussars as light C., for scouring a country. It was in the capacity of light C. that the Prussian Uhlans played so important a part in the late war between Prussia and France, acting as wide-stretching feelers to the main bodies to which they were attached.

The line C. regiments in the British service have generally 8 troops of 55 rank and file each, with 88 commissioned and non-commissioned officers to the regiment. The officers for a full C. regiment comprise 1 col. (as general officer), 1 lieut.col , 1 maj., 8 capts., 18 subalterns and other commissioned officers, and 59 non-commissioned officers. A lieut.col. in the guards C. takes rank with a full col. in the line C.; and a maj. in the former with a lieut.col. in the latter—an arrangement that gives rise to some favoritism and jealousy; for the guards are in no sense more meritorious soldiers than the line.

Nine months of drilling is the least time requisite to make a recruit fit to mount on duty, during which period he is drilled for eight hours a day. Londoners and agricultural laborers are mostly sought for; provincial mechanics are not found so available. The purchase of C. horses is an important matter. The veterinary surgeon of the regiment is sent out to buy; but no horse is paid for till approved by the commanding officer. The usual maximum of price fixed is £33 for a horse 3 to 5 years old; but the horse costs the nation £50 or £60 pounds by the time it is thoroughly fit for service. See DRAGOONS, GUARDS, LANCERS, etc.

CAVALRY (*ante*). The earliest records of C. as a distinct military organization date far back in the history of Egypt. Diodorus of Sicily states that Osymandias, who lived long before the Trojan war, led 20,000 mounted men against the rebels in Bactriana. Josephus states that the host of Israelites which escaped from Egypt included 50,000 horsemen and 600 chariots of war. Herodotus often alludes to C.; and Xenophon relates that in the first Messenian war, 743 B.C., Lycurgus formed his C. in divisions. In the year 371 B.C., Epaminondas had a C. force of 5,000 men, and we know that C. contributed greatly to the victories of Philip and Alexander of Macedon. It had an important part in the battle of the Granicus, 334 B.C.; and at the battle of Arbela, 331 B.C., Alexander, who led the Macedonian C. of 7,000 men, dashed into a gap of the Persian army, and by this brilliant feat utterly routed the enemy. After the death of Alexander, the C. of Greece and Macedon greatly degenerated. The Roman cavalry was very inferior to that of Hamilcar and Hannibal, and most of the victories of these two generals were won by cavalry over the splendid infantry of the Romans. Publius Scipio's defeat at the Ticinus, 218 B.C., was due to the superiority of the Carthaginian horse; and the bitter experience at the Trebia and the battle of Cannæ, 216 B.C., taught the Romans the value of cavalry by which Scipio finally defeated Hannibal at Zama, 202 B.C. Vegetius states that the Roman C. was organized into ten troops or squadrons, forming a regiment of 726 horses, generally attached to some special legion. It is a singular fact that saddles were not in use until the time of Constantine, and stirrups were introduced by the Franks

in the 5th century. During the middle ages C. may be said to have constituted almost the only efficient arm of battle. This was owing to the unwillingness of the nobility in all countries of western Europe to intrust any military power to the serfs; the upper classes went into battle mounted, and both riders and horses had heavy defensive armor. The feudal cavalry consisted of mail-clad knights with their men-at-arms. Their weapons were lances, battle-axes, and swords. The infantry was looked down upon during the middle ages, being composed principally of serfs and such as had not the means to keep a horse; but with the invention of gunpowder, the introduction of muskets, and the use of field artillery, a complete change took place; the infantry gradually rose in reputation, and the number of this class of troops was augmented. It seems that light C. did not exist as a distinct body, with general officers and a staff, before the time of Louis XII. Montluc, however, mentions a general of 12,000 light horse in the time of that monarch; and we hear of Henry II., in 1552, taking a troop of 3,000 cavalry in his expedition to Germany. In 1554, marshal De Brissac formed a corps of mounted infantry, called dragoons, trained to fight either on horseback or on foot. Maurice of Nassau, who saw the importance of giving more mobility to this arm, was the first to organize cavalry regiments, each regiment being composed of four squadrons, formed in five ranks, and numbering about 1000 horses. Gustavus Adolphus was a great C. general, and used his cuirassiers and dragoons to good advantage. His tactics were much admired, and were adopted by many European nations. The French, especially, distinguished themselves after his death in the employment of C. Turenne, Condé, Montecuculi, and Marlborough were considered excellent C. leaders in the wars of Louis XIII. and Louis XIV. Cromwell was indebted to his abilities as a C. officer for the victories of Marston Moor and Naseby. Defensive armor for C. had been abolished in his time, and the C. troops were taught to use the carbine. Charges of cavalry were seldom made in battle except by the French; though Charles XII. always made use of cavalry charges at full speed with great effect. Marshal Saxe made many improvements in this arm, and used guns in connection with cavalry at the battle of Fontenoy, although regular horse artillery was not introduced till 1762. It was not until the wars of Frederick the great, however, that the full importance of cavalry was developed; he saw the necessity of training these troops to use swords instead of fire-arms, and endeavored to make them perfect riders. No firing whatever was allowed in the battle during the first charge; he claimed that the only two things required to beat the enemy were to charge him with the greatest possible speed and force, and then to outflank him. The brilliant victories he obtained from the adoption of these tactics under the able leadership of Seydlitz have probably never been excelled. At the battle of Hohenfriedberg the Prussian cavalry of 10 squadrons broke 21 battalions, routed the entire left wing of the Austrian infantry, and captured 66 standards, 5 guns, and 4,000 prisoners. At the battle of Zorndorf, after the Russians had compelled the Prussian infantry to retreat, Seydlitz with 36 squadrons rode down the Russian cavalry, and then completely routed their infantry. Frederick had learned to appreciate the true principles of mounted warfare through long experience and the occasional disasters which he had met in the first and second Silesian wars; and it was due to the efficient reforms which he instituted in the Prussian cavalry that he was able to win the battles of Rossbach, Striegan, Kesselsdorf, Leutheu, and others. One of the first improvements made in the French army by Napoleon was the reorganization of the cavalry. He increased the cuirassiers from one regiment to twelve, and reintroduced the use of the lance and defensive armor. Some of his splendid victories were due to this force, especially at Marengo and Austerlitz; and it was owing to the loss of the French cavalry in the Russian campaign of 1812 that some of his finest achievements in 1813 proved useless: he was well aware of this, and made the statement that had he possessed cavalry at the battles of Lutzen and Bautzen the war would then have been brought to an end. In modern warfare it may be mentioned that cavalry was conspicuous at the battle of Solferino; but in 1866, the first great European war since Waterloo, neither the Austrian nor the Prussian cavalry won great distinction, although the manner in which the Austrian cavalry covered the retreat of their army at the battle of Königgrätz was a noble example of courage and devotion. In the Franco-German war of 1870, however, the excellency of the Prussian cavalry was the chief means of Von Moltke's ability to carry out his strategic plans. The French cavalry were more remarkable for bravery than efficiency, Great progress was made in the C. of the United States during the war of the rebellion; a large number of men of both armies were good riders, and understood the management of horses. They were at first, however, quite ignorant of military tactics, and were used as scouts, as orderlies, and for outpost service. Gen. Sheridan, acting under instructions from gen. Grant, made the first successful organization of C., which was called the cavalry corps of the army of the Potomac, comprising three divisions of 5,000 mounted men each. Their weapons were repeating carbines and sabers. It was with this force that gen. Sheridan defeated the confederate C. at Yellow Tavern, near Richmond; and it contributed largely to the defeat of Early at the battle of the Opequan, near Winchester; and later, at the battles near Petersburg and at Five Forks, the C. took an important part. Gen. Wilson, whom gen. Sherman put in command of a force called the C. corps of the military division of the Mississippi, did good work in the way of organization towards the close of the war; he had 12,000 mounted

C. and 3,000 who fought on foot at the battle of Nashville, not including a detachment of 3,000 men in Kentucky.

Our C. system is similar to that of European countries; a regiment consists of 10 companies of 64 men each; 2 companies form a squadron; they are armed with sabers, pistols, and carbines. According to the army regulations, the C. in battle should be distributed in echelon on the wings and at the center, on favorable grounds; it should be instructed not to take the gallop until within charging distance; never to receive a charge at a halt, but to meet it; or, if not strong enough, to retire maneuvering; and in order to be ready for the pursuit, and prepared against a reverse, or the attacks of the reserve, not to engage all its squadrons at once, but to reserve one third, in column or in echelon, abreast of or in the rear of one of the wings; this arrangement is better than a second line with intervals. When the regular army, pursuant to the act of congress of Aug. 15, 1876, was reduced to a maximum of 25,000 men, the United States C., consisting of 10 regiments, with 439 officers and 7,911 enlisted men, was left intact.

CAVALRY TACTICS. Authorities differ concerning the proportion that ought to be observed between cavalry and infantry in an army. In France and Austria, the ratio is about 1 to 5; in Prussia and Bavaria, 1 to 4; in Russia, 1 to 6; in England, 1 to 8.

So far as concerns actual duties, heavy cavalry charge the enemy's cavalry and infantry, attack the guns, and cover a retreat; while the light cavalry make reconnaissances, carry dispatches and messages, maintain outposts, supply pickets, scour the country for forage, aic the commissariat, pursue the enemy, and strive to screen the movements of the infantry by their rapid maneuvers on the front and flanks of their army. At the battle of Balaklava, the heavy cavalry charge was within the reasonable duties of the troops, but that of the light cavalry was not; the former succeeded, the latter failed. A cavalry horse will walk 4 m. in an hour on general service, trot 8 m. in maneuvering, and gallop 11 m. in making a charge. The cavalry usually attack in line against cavalry, *en échelon* against artillery, and in column against infantry. When an attack is about to be made, the cavalry usually group into three bodies—the attacking, tlie supporting, and the reserve. Close combat and hand-to-hand struggle are the province of cavalry; infantry and artillery may fight at a distance, but cavalry cannot. It is rare that two bodies of cavalry stand to fight each other; the weaker of the two, or the less resolute, usually turns and gallops off. The work to be done by the horse is to pursue, to overwhelm, to cut down. They cannot wait to receive an attack like infantry; they must either pursue or retreat; and on this account it has been said, "rest is incompatible with cavalry." The infantry and artillery more frequently win the victory; but the cavalry prepare the way for doing this, capture prisoners and trophies, pursue the flying enemy, rapidly succor a menaced point, and cover the retreat of infantry and artillery, if retreat be necessary. Cavalry is necessary to finish off work mainly done by others; and, without its aid, signal success is seldom obtained on the field. Many of the brilliant achievements of the British in 1857 and the following year, in India, were rendered almost nugatory by the paucity of cavalry, while, as a contrast, the German victories of 1870 were enhanced by the splendid services of their uhlans and other light cavalry.

CAVAN, an inland co. in the s. of Ulster, Ireland. It lies in the narrowest part of Ireland, 18 m. from the Atlantic, and 20 from the Irish sea. Area, 746 sq.m. About three fourths is arable. Bogs and hills, with many small lakes, are found in the n.w. The chief rivers are the Erne, the Woodford, and the Annalee. The e. half of C rests on clay-slate and grauwacke; the mountain-district in the w. is carboniferous formation. Of minerals, C. affords coal, iron, lead, and copper, with many mineral springs. The climate is cold and damp; and the soil is poor, wet, and clayey, except along the streams. In 1878, of 466,261 acres, 153,114 were in crop, the chief crops being oats, potatoes, turnips, and flax. The farms are small. The population, which had fallen to 153,906 in 1861, was in 1881 only 129,476, of whom 104,328 are Roman Catholics, 18,990 Episcopalians, and the rest of other denominations. Agriculture forms the chief industry, but linen is manufactured to a considerable extent. Chief towns—Cavan, Bailieborough, and Belturbet. C. returns two members to parliament. The number of children attending school in the year ending March 31, 1880, was 30,000.

CAV'AN, the capital of Cavan co., Ireland, is situated on a branch of the Annalee, 70 m. n.w. of Dublin, with which it is connected by the Irish N. W. railway. The suburbs are chiefly wretched cabins. The principal buildings are in the w. outskirts. The public garden was bequeathed by a late lady Farnham, and the beautiful demesne of lord Farnham lies between C. and Lough Oughter, which is about 5 m. west. Pop. '81, 3,050. Agriculture forms the chief industry of the people.

CAVARZE'RE, a t. of Northern Italy, province of Venice, 22 m. s.s.w. of Venice city. Pop. 12,400. It is situated on the Adige, which divides it into two parts called C. *destro* and C. *sinistro.* Its soil is fertile, and its inhabitants carry on an active trade in cattle, silk, and wood for fuel.

CAVATI'NA, a short form of operatic air, of a soft character, differing from the ordinary aria in consisting only of one part, and that spun out more in the form of a song. Modern composers have, however, disregarded this difference. Rossini mixes both.

Weber, in his operas, adds an introduction or a recitative. The most perfect specimen of the C. is that in Meyerbeer's opera of *Robert the Devil.*

CAVE, Edward, deserves mention as the founder of the *Gentleman's Magazine,* the first literary journal of the kind ever established. He was b. at Newton, in Warwickshire, in 1691; obtained a good education at Rugby; and, after many vicissitudes, became apprentice to a printer. Obtaining money enough to set up a small printing-office, he projected the *Gentleman's Magazine,* which has now existed more than a century and a quarter. He was the friend and early patron of Samuel Johnson. D. Jan., 1754.

CAVE, William, an English divine and scholar of distinction, was b. at Pickwell, Leicestershire, Dec., 1637. He studied at Cambridge; was appointed to the vicarage of Islington in 1662; afterwards to the rectory of Allhallows the Great, London; and in 1690 to the vicarage of Isleworth, Middlesex. He d. at Windsor, Aug. 4, 1713. He was the author of many works of a religious character, the most important of which are the *Lives of the Apostles; Lives of the Fathers;* and *Primitive Christianity,* which were once standard works.

CAVEAT (Lat. *caveo,* to beware), a judicial warning or caution. Caveats, in England, are used to stop the enrollment of decrees in chancery, the issuing of lunacy commissions, etc. It consists in an intimation by the party interested to the proper officer, to prevent him from taking any step without such intimation being made to the said party as shall enable him to appear and object.

CAVEAT EMPTOR, notice to a purchaser of property to beware or be watchful of his rights. In a sale of real estate the rights of the purchaser depend entirely upon the covenants of title which he receives; but personal property the purchaser takes at his own risk, unless the seller gives an express warranty, or the law should imply such warranty from the circumstance of the case and the nature of the thing sold, or unless the seller should be guilty of fraudulent misrepresentation or concealment in respect to a material inducement to the sale.

CAVEAU, a convivial and literary association in Paris, so called from meeting in a cavern known as "the cave." It was started in 1729, and continued about ten years. Dinners were given on the first Sunday in each month, which were attended by Helvetius, Crebillon, and other celebrities. The Caveau Moderne was started in 1806, and had dinner on the 20th of each month at the Rocher de Cancale. The association declined, but was reorganized in 1834, and in 1866 Jules Janin was received as a member. The meetings are now more formal and academical than convivial.

CAVEDO'NE, Jacopo, 1577–1660; an Italian painter, educated in the school of Caracci, and workman under them in the churches of Bologna. His chief productions are "The Adoration of the Magi;" "The Four Doctors;" "The Last Supper;" and especially "The Virgin and Child in Glory," now in the Bolognese academy. He was at one time an assistant to Guido, in Rome. In his declining years he was broken down by the loss of a favorite son, and finally died in extreme poverty in a stable at Bologna.

CAVELIER', Pierre Jules, b. 1814; a French sculptor, who studied under David d'Angers and Delaroche. He first gained celebrity about 1849 by a statue of "Penelope," for which he received the medal of honor and three years' pension. A few years later he became a member of the institute. Among his other works are "Truth," in the Louvre, a statue of Abelard, and busts of Napoleon, Ary Schaffer, and Horace Vernet.

CAVENDISH, Ada. See page 891.

CAVENDISH COLLEGE. See page 891.

CAVENDISH, Frederick Charles, Lord. See page 891.

CAVENDISH, Henry, a distinguished philosopher of the 18th c., son of lord Charles Cavendish, and nephew of the third duke of Devonshire, was born at Nice, Oct. 10, 1731. He studied at Cambridge, and devoted his whole life to scientific investigations. The large fortune which was bequeathed to him by an uncle, enabled him to follow uninterruptedly his favorite pursuits. He almost secluded himself from the world, and was so averse to meet with strangers, that he had his library—a magnificent one—built at a distance from his house, so that he might not encounter persons coming to consult it; and his female domestic servants had orders to keep out of his sight, on pain of dismissal. His dinner he ordered daily by a note placed on the hall-table. He died, unmarried, Feb., 1810, leaving considerably more than a million sterling to his relatives. As a philosopher, C. is entitled to the highest rank. To him it may almost be said we owe the foundation of pneumatic chemistry, for prior to his time it had hardly an existence. In 1760, he discovered the extreme levity of inflammable air, now known as hydrogen gas—a discovery which led to balloon experiments, and projects for aërial navigation; and later, he ascertained that water resulted from the union of two gases—a discovery, however, to which Watt (q.v.) is supposed to have an equal claim. The accuracy and completeness of C.'s processes are remarkable. So high an authority as sir Humphry Davy declared, that they "were all of a finished nature, and though many of them were performed in the very infancy of chemical science, yet their accuracy and their beauty have remained unimpired amidst the progress of discovery." C. also wrote papers on electricity, astronomical instruments, etc.

CAVENDISH, Margaret, Duchess of Newcastle, second wife of William, b. about the end of the reign of James I., is perhaps one of the most remarkable instances on

record of a person afflicted with the *cacoëthes scribendi*, who had no capacity whatever for writing. She produced no less than 13 folio volumes, 10 of which were printed, treating, indifferently, on all subjects in prose and poetry, and careless in all, both as to grammar and style. Her mania for scribbling kept up her maids at night, so that, if she chanced to wake with anything on her mind, they might be ready to note it down at once. The duchess was relieved, but a dead-weight fell upon the field of literature. She died in 1673.

CAVENDISH, Thomas, 1560–92; the third circumnavigator of the globe. He studied for a brief period at Cambridge, but left without a degree, followed the court, and soon squandered his inheritance, to repair which he turned to maritime adventure, and fitted out a ship that accompanied sir Richard Grenville's expedition to Virginia in 1585. In July, 1586, he sailed from Plymouth with three vessels on a predatory expedition, passed through the straits of Magellan, cruised along the west coast of South America and Mexico, and burned or sunk 19 vessels, among which was the *Santa Anna*, belonging to the king of Spain, and having an immensely valuable cargo, which he seized off California. He returned to Plymouth Sept. 9, 1588, with his plunder, having gone around the globe in 2 years and 50 days. When he came home it was said that his seamen were clothed in silk, his sails were of damask, and his topmast was covered with cloth of gold. Within three years he wasted his wealth, and was under the necessity of making another voyage, which was disastrous, his crew rebelling after leaving the straits of Magellan and compelling him to return to England. This so dispirited him that he died on the voyage.

CAVENDISH, Sir William, 1505–57; brought up in the family of cardinal Wolsey, whom he served as gentleman-usher of the chamber. He was present at the death of the cardinal, and delayed his attendance at court to see the remains of his patron properly cared for. The act so pleased Henry VIII. that he made Cavendish a member of his household, treasurer of his chamber, and a privy councilor, subsequently adding the dignity of knighthood. He filled other offices, and obtained grants of valuable lordships in Hertfordshire. His great property became the foundation of the immense estates of the dukes of Devonshire. He seems to have retained favor through the reigns of Edward VI. and Mary. He was the author of *The Life and Death of Cardinal Wolsey.*

CAVENDISH, William, duke of Newcastle, a distinguished loyalist of the 17th c., son of sir Charles Cavendish, younger brother of the first earl of Devonshire, was b. 1592. His learning and winning address made him a favorite at the court of James I., who, in 1610, made him a knight of the Bath. Other honors rapidly succeeded. In 1620, he was made a peer of the realm. Charles I., about 1628, gave him the title of earl of Newcastle-upon-Tyne, and in 1638 intrusted him with the tuition of his son, afterwards Charles II. His support of the king during the contest with the parliamentary forces was munificent. He contributed £10,000 to the treasury, and raised a troop of 200 knights and gentlemen, who served at their own cost. As general of all the forces raised n. of the Trent, he had power to issue declarations, confer knighthood, coin money, and raise men; and the last part of his commission he executed with great zeal. The banquets C. gave to the king when he went n. were magnificent enough to find record in history; one of them cost no less than £15,000, even in those days when money was more valuable than it now is. After the battle of Marston Moor, C. retired to the continent, where he resided, at times in great poverty, until the Restoration. On his return, he was created duke of Newcastle. He died Dec. 25, 1676. On the continent, he devoted himself to literature, and wrote a book on the management of horses, and several plays, not of a character to increase any man's reputation for intelligence.

CAVENDISH'S EXPERIMENT. See Earth, *ante.*

CA'VERY, or Cau'very, a river in India, rising about 12° 25′ n., and 75° 34′ e., and flowing s.e. to the bay of Bengal. It is about 470 m. long, but navigable only for small boats.

CAVES, or Caverns (Lat. *cavus,* hollow), are hollow places in the earth. They are either natural or artificial. Natural C. have been produced by the fracture and dislocation consequent on the upheaval of the strata, by water, or by both causes combined. The denuding or eroding power of water, which has produced the materials of stratified rocks, has formed caverns in the courses of rivers and on the coast-line of the sea. The moving waters, carrying with them gravel and sand, enter natural cracks and crevices, and, by abrading their walls, increase their size, so as to form C.; or they attack less indurated portions of the solid strata, and form cavities bounded by the harder rock. Such caverns are of frequent occurrence round the shores of Britain, and indicate, where they occur, an ancient sea-margin of the island. In limestone rocks, the destroying power of water is increased when it contains chemical agents which have the power of dissolving the substance of the rock, and so causing it to be carrried off in solution by the water.

C. most frequently occur in limestone rocks. They especially abound in the oolitic limestone, which on this account was called by the earlier continental geologists "cavern limestone." The celebrated C. of Franconia in Germany, of Kentucky (q.v.) in America, that of Kirkdale in Yorkshire, and many others, occur in this formation. Next to limestone, the triassic measures, containing rock-salt, a material easily removed

by water, most abound in caverns. They are also frequently met with in igneous rocks —the picturesque cave of Fingal, in Staffa, is formed in basalt; and in South America and Iceland the modern lava contains large caverns.

Many caverns have a calcareous incrustation lining their interior, giving them a gorgeous appearance. Sometimes this deposit is pure white, and has, when the cave is lighted up, a richness and transparency that cannot be imagined. It is, however, more generally colored by the impurities which the water has taken up from the superincumbent strata. To the incrustations which are suspended from the roof, like icicles, the name stalactite is given, while those rising from the floor are designated stalagmites. Sometimes the pendent stalactite is produced so as to meet the ascending stalagmite, and form pillars, as if to support the roof, as in the "organ" in the Blue John Mine, Derbyshire. The source and origin of this deposit has been satisfactorily explained by Liebig as follows: The mold of the superficial soil, being acted upon by moisture and air, evolves carbonic acid, which is dissolved by rain. The rain-water thus impregnated, permeating the calcareous strata, has the power of taking up a portion of the lime, which it retains in a liquid condition, until from evaporation the excess of carbonic acid is parted with, when the lime again returns to its solid state, and forms the incrustation.

C. have an additional interest to the geologist, from the occurrence in many of osseous remains under the calcareous incrustations of the floor. The bones are imbedded in mud, and frequently concreted into a firm calcareous breccia. They belong to the pleietocene period, when the C. in Europe were inhabited by large hyenas and bears. Portions of other animals inhabiting the neighborhood were dragged by them into their dens, to serve as food. In this way the bones of herbivorous and other animals are found mixed with those of the beasts of prey; they have a broken and gnawed appearance, similar to what is produced on recent bones by the teeth of a hyena. No less than 33 species of mammals and 5 species of birds have been discovered in the C. of the British islands, of which about the half still survive in Europe, while the remainder are extinct. The mammals are species of ox, deer, horse, wolf, dog, hare, fox, weasel, water-rat, mole, bat, hippopotamus, and rhinoceros, besides the hyena and bear; and the birds are species of lark, partridge, pigeon, goose, and crow.

The most productive ossiferous cavern in Britain is that of Kirkdale, 25 m. from York, in which the remains of about 300 hyenas have been detected, besides innumerable gnawed bones of those animals on which they preyed. The carboniferous limestones of Glamorganshire abound in caves which have been explored by Buckland, and more recently and thoroughly by Dr. Falconer. At the meeting of the geological society in June, 1860, Dr. Falconer thus describes the contents of one of them, called Bacon hole. On the limestone floor of the cave are—(1) a few inches of marine sand, abounding with *litorina rudis*, *L. litoralis*, and *clausilia nigricans*, with bones of an *arvicola* and birds; (2) a thin layer of stalagmite; (3) two feet of blackish sand, containing a mass of bones of *elephas antiquus*, with remains of *meles taxus* and *putorius;* (4) two feet of ocherous earth, limestone breccia, and sandy layers, with remains of *elephas antiquus*, *rhinoceros hemitœchus*, *hyæna*, *canis lupus*, *ursus spelæus*, *bos*, and *cervus;* (5) irregular stalagmite; (6) two feet of limestone breccia and stalagmite, with bones of *ursus* and *bos;* (7) a foot or so of irregular stalagmite, with *ursus;* and (8) dark-colored superficial earth, kept sloppy by abundant drip, with bones of *bos*, *cervus*, *canis vulpes*, horns of reindeer and roebuck, together with shells of *patella*, *mytilus*, *purpura*, and *litorina* (probably brought into the cavern as food by birds), and also pieces of ancient British pottery. After a review of the fauna of the bone-caves of this country and of Europe, Dr. Falconer concludes that the caves of Glamorganshire have probably been filled up with their mammalian remains since the deposition of the boulder-clay, and that there exist no mammalian remains in the ossiferous caves of England and Wales referable to a fauna of a more ancient geological date. See KENT'S CAVERN.

Ossiferous C. occur in all parts of the globe. The fossils of those in Australia show that the fauna of the pleistocene period had a remarkable resemblance to that of the present day. The remains consist chiefly of kangaroos and allied genera of marsupials.

CAVIA'NA, an island of Brazil, in the mouth of the river Amazon, about 35 m. long by 20 wide; fertile and well-stocked with cattle. The little town of Robadello, on the s.e. coast of the island, is almost exactly under the equator.

CAV'IARE, the salted roes of the common sturgeon (*accipenser sturio*) and other fishes of the same genus. See STURGEON. It is chiefly prepared in Russia, where it is greatly esteemed as an article of food. It is also used to a considerable extent in Italy and France. The species of sturgeon from the roe of which it is chiefly prepared, inhabit the Caspian and Black seas and their tributary rivers. Among them are the bielaga, or great sturgeon (*accipenser huso*), the osseter (*A. guldenstadtii*), the scherg or sevruga (*A. stellatus*), and the sterlet (*A. ruthenus*). The C. made from the roe of the last-named species is esteemed particularly delicious, and is reserved for the Russian court. Astrakhan is a principal seat of the preparation of caviare. More than 400,000 lbs. of C. have been prepared in the Caspian fishery in a single year.

CAVILEER: co. Dak. See page 891.

CAVITÉ, a t. of considerable importance on the island of Luzon, one of the Philippines. It is situated on the bay of Manila, 10 m. s.s.w. of the city of that name, of which

it forms the quarantine station. It has a large cigar manufactory, is the chief naval depot of the Spanish possessions in the east, and gives name to a province with a pop. of 57,000. The population of the town itself is some 6,000 or 7,000.

CAVOR, or CAVOUR′, a t. of n. Italy, situated at the foot of the Alps, 7 m. s.s.e. of Pinerolo. It has manufactures of silk-twist, linens, leather, etc., and marble and slate quarries. Pop. 6,000 or 7,000.

CAVO-RILIE′VO (Ital.). In this peculiar kind of rilievo, which was extensively employed by Egyptian artists, the highest surface of the object represented is only on a level with the plane of the original stone, the rounded sides being cut into it. The effect resembles that of a concave seal. It is correctly described as *intaglio rilievato.* A wood-cut is given in Fairholt's *Dictionary of Terms in Art* of the Egyptian king Amunoph III. in hieroglyphics.

CAVOUR, Count CAMILLA BENSO DI, a distinguished Italian statesman of the 19th c., the descendant of a noble and wealthy family of Piedmont, was b. at Turin, Aug. 10, 1810. He was educated for a military career, but his liberal tendencies being likely to prove an insuperable barrier to his promotion, he retired during the stirring events of 1830–31, and devoted himself to agriculture, in which he introduced great improvements. He was the first to use guano in Piedmont; and, at his instigation, a national agricultural society was formed. During a residence in England, he made himself intimately acquainted with the political organization of the country, and also with its industrial institutions; knowledge of which he made good use on his return to his own country in 1842. In conjunction with Count Cesare Balbo, he in 1847 established a political daily journal, in which he advocated the interests of the middle classes—a representative system, somewhat after the pattern of the English constitution, as opposed alike to absolutism on the one hand, and mob rule on the other. On his suggestion, the king was petitioned for a constitution, which was granted in Feb., 1848. As a member of the chamber of deputies, during the stormy period which succeeded Charles Albert's declaration of war against Austria in Mar., C. strenuously opposed the ultra-democrats, and counseled an alliance with England as the surest guarantee for the success of the Italian arms. In the marquis d'Azeglio's ministry, formed soon after the fatal battle of Novara, C. was successively minister of agriculture and commerce, minister of marine, and minister of finance; and in 1852 he was appointed to succeed d'Azeglio as premier. From this time until his resignation in 1859, in consequence of the conclusion of the peace of Villafranca, C. was the originator as well as the director of the Sardinian policy. Taking upon himself at different times, in addition to the premiership, the duties of the ministers of finance, commerce, and agriculture, and latterly of home and foreign affairs, he greatly improved the financial condition of the country, introduced free-trade, consolidated constitutionalism, weakened clerical influence, and made Sardinia a power of some account in Europe, by bringing her into alliance with England and France against Russia. The dispatches which C. penned in reply to those of Austria, prior to the outbreak of the Italian war, are on all hands acknowledged as masterpieces of astute diplomacy. In Jan., 1860, C. was again called upon to preside over the Sardinian government, the duties of foreign minister likewise devolving upon him, and temporarily those of the minister of the interior also. He continued to direct the Sardinian policy until his death, June, 1861.

CA′VY (*cavia*), a genus of quadrupeds of the order *rodentia*, regarded as the type of a family, *cavidæ*, differing from the hare family (*leporidæ*), in the complete want of clavicles, in the want of growing roots to the molar teeth, and in having the incisors situated as in other quadrupeds generally, and not in the peculiar manner so characteristic of the hares. There are four molar teeth in each jaw, and in the genus C. these are compound; and the genus is further characterized by four toes on each of the fore-feet, and three on each of the hind-feet, by the feet not being webbed, by the females having only two teats, and by the want of a tail. One species, *cavia cobaya*, has been long well known as a domesticated animal, and has been a common pet and plaything of children in Europe, almost from the time of the discovery of America. It is sometimes called the COMMON C. or RESTLESS C., but much more frequently receives the name of GUINEA-PIG, although it is neither nearly related to pigs, nor a native of Guinea. Perhaps *Guinea*, in this name, may be a corruption of *Guiana*, the cavies, and indeed the whole family of the *cavidæ*, being exclusively South American. The colors which the domesticated C. exhibits have never been seen in any of the wild cavies of South America; and as it is known to have exhibited the same variations of color from about the time of its introduction into Europe, it is supposed to have been long domesticated by some of the South American tribes. The Guinea-pig multiplies with a rapidity exceeding that of any other known quadruped, producing young ones when only two months old, and afterwards at intervals of two months, and from four to twelve in a litter. This extraordinary fecundity is probably not so much the result of domestication, as a provision for the preservation of the race in a wild state, the little animal being very defenseless and destitute of means of escape, the ready prey of every carnivorous beast and bird.—The other species of C. much resemble the Guinea-pig. Some of them are very numerous in some parts of South America, and are sought for food, although no such use is made of the domesticated cavy. The agouti (q.v.) and the capybara (q.v.) are ranked among the *cavidæ.*

CAWDOR, or CALDER, a parish in co. Nairn, Scotland, noted as the site of Cawdor castle in which Shakespeare places the murder of Duncan by Macbeth. But the murder took place 400 years before the castle was built—which may prove that Shakespeare was "not for a day but for all time." During the rebellion of 1745, lord Lovat was for a time concealed in this castle.

CAWK, a popular name for a massive variety of the mineral called heavy spar or sulphate of baryta. See BARYTA.

CAWNPORE', a city of the Doab, on the right bank of the Ganges, about 140 m. above Allahabad, at the junction of the Jumna, being separated by the river from Oude, whose capital, Lucknow, lies 53 m. to the n.e. The lat. is 26° 29′ n., and the long. 80° 25′ east. The stream in front, varying, according to the season, from 500 yards in width to more than a mile, presents a large and motley assemblage of steam-vessels and native craft. C., at least as a place of note, is of recent origin, being indebted for its growth, besides its commercial facilities, partly to military and political considerations. In 1777, being then an appendage of Oude, it was assigned by the nawab as the station of a subsidiary force; and in 1801 it became, in name as well as in fact, British property. Its cantonments, having accommodation for 7,000 troops, have gradually accumulated about 50,000 native inhabitants; while the city itself contains a somewhat larger population of similar origin. During the mutiny of 1857, C. was the scene of Nana Sahib's massacre of his English captives. Though C. is only 379 ft. above the sea, yet, during winter, considerable quantities of ice are made for preservation, through the exposing of water by night in shallow vessels. Pop. '81, of C. (spelt also *Khanpur*), 119,603.

CAWNPORE, the district of the above-described city, in the lieutenant-governorship of the n.w. provinces. Occupying the entire breadth of the Doab, it touches at once the Jumna and the Ganges; while to the eastward it has Futtehpore, and, to the westward, Etawah and Furruckabad. With a pop. in '71 of 1,155,439, it has an area of 2,353 sq.m., stretching in lat. from 25° 55′ to 27° n., and in long. from 79° 34′ to 80° 37′ east. It is an alluvial plain of great fertility. The vine is cultivated, and indigo grows wild. Besides its two mighty rivers and their navigable tributaries, the Ganges canal traverses the country for about 60 miles.

CAXAMAR'CA, or CAJAMARCA, a province in the n.w. of Peru, with a capital of its own name. It is on the e. side of the Andes, forming part of the basin of the Maranon. The province has 273,000 inhabitants, and the city about 20,000.

CAXAMAR'CA, or CAJAMARCA, a Peruvian city, the capital of the province of the same name, on the e. side of the Andes, in a fertile valley at an elevation of more than 9,000 ft. above tide, 7° 7′ s. and 78° 31′ w.; 72 m. n.n.e. of Truxillo. The streets are regular, but most of the houses are of clay. There are two or three fine churches, a monastery, a nunnery, and the remains of the palace of Atahualpa, the last of the Incas of Peru, who was murdered there by the Spaniards in 1533. Near the city are the sulphur springs of Pultamarca, called "the Inca's baths," which have a temperature of 156° and are much frequented. There are manufactures of wool, linen, steel, silver, etc., and a good trade with Truxillo. A railway connects C. with the port of Pacasmayo. Pop. 12,000.

CAXAMARQUIL'LA, a t. of n. Peru, in the province of Libertad, 100 m. e.n.e. of Truxillo. Pop. about 8,000.

CAXATAM'BO, or CAJATAMBO, a t. of n. Peru, in the province of Ancachs, 120 m. n.n.e. of Lima, with a pop. of about 6,000. There are silver-mines in the neighborhood.

CAXI'AS, a t. in Brazil on the river Itapicuru, about 300 m. s.e. of Maranhao. It is a place of large trade in rice, cotton, cattle, etc.

CAXTON, WILLIAM, who introduced printing into England, was b. in the Weald of Kent, about 1422. The particulars of the life of this great benefactor of his country are scanty. He was apprenticed in 1439 to Robert Large, a wealthy London mercer. At the death of the latter in 1441, he went to Bruges, where in 1462 or 1463 he seems to have been governor of a chartered association of English adventurers trading to foreign parts. In 1471, C. entered the service of Margaret, the duchess of Burgundy, formerly an English princess; and apparently towards the end of 1476 he set up his wooden printing-press at the sign of the red pale in the almonry at Westminster. The art of printing he had acquired during his sojourn in Bruges, doubtless from Colard Mansion, a well-known printer of that city; and in 1474 he put through the press the first book printed in the English tongue, the *Recuyell of the Historyes of Troye,* a translation of Raoul le Fevre's work. The *Game and Playe of the Chesse* was another of C.'s earliest publications; but the *Dictes and Notable Wise Sayings of the Philosophers,* published in 1477, is the first book which can with certainty be maintained to have been printed in England. All the eight founts of type from which C. printed may be called black letter. Of the 99 known distinct productions of C.'s press, no less than 38 survive in single copies or in fragments only. C., who was an accomplished linguist, and translated many of the works that issued from his press, was diligent in the exercise of his craft or in translation till within a few hours of his death, which seems to have happened about the close of the year 1491. In 1877, the printer and his work were fittingly commemorated by a

typographical exhibition in London. See *The Old Printer and the New Press*, by Charles Knight (1854); *Life and Typography of William C.* (1861–63), by W. Blades; and the *Biography and Typography of C.* (1877), by the same author.

CAYAM'BE, or CAYAMBE-URCU, a peak of the Andes, 45 m. n.e. of Quito, in Ecuador. It is of regular conical shape, 19,540 ft. high, and always capped with snow. It is especially notable for being situated almost exactly under the equator.

CAYCOS, or CAICOS, or THE KEYS, four of the Bahama islands, in the Atlantic, between 21° and 27° n., and about 72° west. Great Key is 30 m. long. Little and North Keys and Providence island are smaller.

CAYENNE, a fortified seaport, capital of French Guiana, on the west point of an island of the same name at the mouth of the river Oyak. The roadstead is excellent, and the port commodious but shallow. C., though it is the entrepôt of all the trade of the colony, is chiefly known as a great French penal settlement. The island, 32 miles in circumference, is separated from the mainland by a narrow channel; its soil is fertile, but the climate is extremely unwholesome for Europeans, large numbers of the convicts having been carried off by various malignant fevers. C. became a French colony about 1635; deportation hither began during the first French revolution. Pop. about 8,000.

CAYENNE CHER'RY. See EUGENIA.

CAYENNE PEPPER consists of the powder of the dried pods, and more especially of the dried seeds of different species of Capsicum (q.v.), particularly of *C. frutescens.*

CAYLEY, Sir GEORGE, 1733–1857; an English physicist and inventor, whose experiments on the steam engine resulted in the invention of the air engine. Among his other inventions was an arrangement for applying the power of electricity to machinery. He was one of the originators of the London polytechnic institution, and late in life was a member of parliament for Scarborough.

CAYLUS, ANNE CLAUDE PHILIPPE DE TUBIÈRES, Count de, Marquis d'Esternay, Baron de Bransac, 1692–1765. When young he served with distinction in the French army, but after the peace of Rastadt (1714) he traveled extensively in Europe and the east, studying and collecting antiquities, on which he published several works. He rediscovered the method of encaustic painting with wax, mentioned by Pliny. He was also an engraver, and copied many of the famous pictures of the old masters. But he is best known as the author of several romances, humorous pieces, and fairy tales.

CAYLUS, MARTHE MARGUERITE DE VILLETTE DE MURCAY, Marquise de, 1673–1729; a descendant of the family of D'Aubigne, but converted by Mme. Maintenon to the Roman Catholic faith. She acquired celebrity as one of the leaders of court society. Racine so admired her abilities that he wrote the prologue to his tragedy of *Esther* as a compliment to her. Her first husband, the marquis de Caylus, was worthless and dissipated. After his death, she became the mistress of the duke of Villeroi, for which she was sent away from the court; but after the death of Mme. Maintenon she was restored to favor. Voltaire edited her *Souvenirs.*

CAYMAN, a name somewhat variously used, either as the distinctive appellation of some, or as a common name for all the *crocodilidæ* of South America. See ALLIGATOR. The genus *alligator* is by some naturalists of the present day divided into three genera, to one of which the name C. (*caiman*) is appropriated, and of which the type is the species called the eye-browed C. (*alligator palpebrosus*), to which the name C. is distinctively applied in Surinam and Guiana, a species very abundant there, but not one of the largest or more dangerous of its tribe. It is remarkable for the three bony plates, separated by sutures only, which form each eyebrow or eyelid, projecting as large knobs like a man's fist; and this, and the scarcely webbed-feet, constitute the most important characters of the genus or subgenus cayman. To this subgenus belong also *A. trigonatus*, regarded by Cuvier as a mere variety of the same species, and *A. gibbiceps.*

CAYMANS—in English, *alligators*—three low islets of the Caribbean sea, which form a dependency of Jamaica, being 130 m. to the n.w. of it. Discovered by Columbus, they were by him called Tortugas, from the abundance of turtle—still the staple production of the group. On an area of about 2,000 acres, the population does not exceed 1500 or 1600. The soil yields corn and vegetables; and the people rear hogs and poultry.

CAYUGA, a co. in w. central New York, extending from lake Ontario half way across the state, intersected by the New York Central and several other railroads; 752 sq.m.; pop. '80, 65,084. It is a fine agricultural section, with undulating surface. Gypsum, salt, and limestone are among the minerals. Near the center of the co. lies Owasco lake, about 10 m. long, and on the w. border is Cayuga lake. The chief productions are wheat, corn, oats, barley, potatoes, hay, butter, wool, and tobacco. Co. seat, the city of Auburn.

CAYUGA LAKE, a fine navigable sheet of water in w. central New York, 38 m. long, and from 1 to 3½ m. wide. At the n. end it is shallow, but in some places it is very deep. It is 377 ft. above tide water. and 146 ft. higher than lake Ontario, into

which it empties through Seneca river. The lake is much frequented by tourists and pleasure seekers.

CAYUGAS, one of the Indian tribes forming the Six Nations in New York. They built the villages around Cayuga lake in central New York, and, when first known by the French explorers from Canada, were able to muster several hundred warriors. The C. were, with the other Iroquois, against the French in the wars of the 17th century. A few of their chiefs became Christians; and one who was taken in war and sent to the galleys in France, on his return to Canada became a friend of the white man. In the American revolution they were on the English side. After peace, they ceded nearly all their lands to the state except a small reservation, and that they abandoned about 1800, when some of them went to the Senecas, some to Canada, and others to the Indian country. Scarcely 200 of the tribe now remain.

CAZAL'LA DE LA SIER'RA, a t. of Spain, in the province of Seville, 39 m. n.e. of the city of that name. It is situated on a declivity of the Sierra Morena; the district around is mountainous and well wooded, and abounds in minerals of various kinds, including iron, silver, copper, sulphur, and marble. The inhabitants, numbering between 7,000 and 8,000, are chiefly employed in smelting metals, manufacturing cannon, machinery, and agricultural implements. Some tanning, weaving, etc., are also carried on.

CAZEMBÉ, or KAZEMBE, an important country of Africa, the limits of which have not been clearly determined, but its center has been fixed at about lat. 12° s., and long. 31° east. The king's rule extends over a great portion of the established route across the continent of Africa, from the Congo, up the valley of Lulúa, and down the valley of Luapúla. Vegetation is generally luxuriant. Its chief products are manioc, maize, salt, copper, iron, and ivory. The people are called Balonda or Baloi.

CAZEM'BE (*ante*), the hereditary name of an African chief, whose territory is s. of lake Moero, and n. of Bangweolo, between 11° and 9° s.; 120,000 sq.m.; pop. 500,000. The country forms a hollowed plain, and is watered by numerous rivers, among the most important of which is the Luapula, which is supposed to be one of the head streams of the Congo. The population consists of two races, the Messiras and the Campololas, of whom the former are natives subjugated, and the latter intruders and rulers; they alone being eligible to office, and theirs being the language of the court. Some attention is paid to agriculture, and millet, maize, manioc, sugar-cane, yams, gourds, and bananas are grown. The horse and the ass are unknown animals; sheep are scarce, but cattle are abundant. Salt is an important article of trade, and coarse cotton cloth, earthenware, and iron goods are the chief manufactures. The exports are slaves, ivory and copper-ore. The chief, or cazembe, has despotic power, and uses it barbarously. He has 600 wives, and the great nobles take as many as they can afford to keep. The capital is moved whenever a new ruler is put in power. The country of the Cazembe was first visited by white men in 1796. It has not yet been explored to any considerable extent.

CAZENO'VIA, a village and township in Madison co., N. Y.; pop. '80, 4,363. The village is on Cazenovia lake, and is reached by the Cazenovia and Canastota railroad. There is a Methodist seminary in the place.

CAZOR'LA, a t. of Andalusia, Spain, 40 m. e.n.e. of Jaen. C., which is a place of considerable antiquity, is pleasantly situated on a declivity, and is well watered by the Vega; has two old castles—one an Arab structure—manufactures of leather, earthenware, soap, and bricks, and a trade in agricultural produce. Pop. 7,500.

CAZOTTE, JACQUES, 1720–92; a French author, educated by the Jesuits. He produced at first a mock romance and a coarse song which became so popular that he undertook something more respectable and brought out his *Roman d'Olivier*. This was followed with *Le Diable Amoureux*, and another sportive creation. He also continued Voltaire's *Civil War in Geneva* with such close similarity that no one doubted the work to be that of Voltaire. Cazotte next took a wide departure, embraced the views of the Illuminati, and declared that he possessed the power of prophecy. He adhered to the royal cause, in consequence of which he was arrested by the revolutionary tribunal and executed.

CEANO'THUS. See RED ROOT.

CEARA, a province of Brazil, on the n. coast, situated in lat. 2° 40′ to 7° 25′ s., long. 37° 40′ to 41° 30′ west. It has an area of 42,600 sq.m., with, '72, 700,000 inhabitants. It abounds in balsams, gums, resins, and fruits; and among its minerals are gold, iron, copper, and salt. The *port* of C. had a trade with Great Britain in 1874 amounting to £969,584.

CEBADIL'LA. See SABADILLA.

CEBES, a Greek philosopher, disciple of Socrates, mentioned by Plato and by Xenophon as distinguished for virtue and love of truth. The work *Tabula Cebetis* attributed to him professes to be an explanation of an allegorical picture, and begins with the Platonic doctrine that men enter the earth from a pre-existent state, in which they were taught how to guide their course in this world; but the draught of oblivion, which all

must drink, though not in equal quantities, causes them to forget the instructions. Many allurements entice them to vice, but by patience and endurance they may attain to virtue and happiness. Sciences are declared not to be the true discipline, but yet to be useful, especially as restraint for the young.

CEBU, a city on the island of Cebu, one of the Philippines, 400 m. s.e. of Manila. Cebu is the oldest provincial town in the archipelago, and still ranks as one of the best built, while its position makes it the chief commercial center for the southern Philippines. It is the residence of a military governor, and an alcalde, as well as the governor-general of the Vissagas. There are exports of sugar, hemp, tobacco, Japan-wood, etc. The grave of Magellan, the navigator, is on the island of Matan, opposite the town. Pop., inclusive of the suburb of St. Nicholas, about 34,000.

CEBU, or ZEBU, one of the Philippine islands, between 9° 35′ and 11° n., and 123° and 123° 50′ e.; about 1200 sq.m. The surface is rough, and the soil not suited to agriculture, though there are fertile valleys producing cotton, sugar, rice, tobacco, and cocoa. The climate, though very hot, is salubrious.

CE'BUS (Gr. an ape or monkey), a genus of American monkeys, characterized by a round head and short muzzle, a facial angle of about 60°, long thumbs, and a long prehensile tail entirely covered with hair. The species are numerous, all of very lively disposition and gregarious habits, living in trees. They feed chiefly on fruits, but also on insects, worms, and mollusks. They are included under the popular designation SAPAJOU in its wider sense, and some of them are the monkeys to which this name is sometimes more strictly appropriated. The names SAJOU and SAI are also given to some of them, and some are called Capuchin (q.v.) monkeys. One of the most common species in Guiana is the WEEPER MONKEY, or WEEPER SAPAJOU (*C. apella*).—The name capuchin is perhaps most frequently given to *C. capuchinus,* a brownish species, with head, feet, and hands generally black, and front, shoulders, and cheeks whitish. Some of the species of C. are adorned with beards.—The name *cebidæ* is sometimes given to the American monkeys collectively, as a family or tribe. See MONKEY.

CEC'CO D'ASCOLI, 1257–1327; the popular name of FRANCESCO DEGLI STABILI, a mediæval poet and encyclopædist. He studied mathematics and astrology, and was professor of the latter science in the university of Bologna. Having published a commentary on the sphere of John de Sacrobosco, in which he propounded bold theories concerning the employment and agency of demons, the clerical party caused him to be condemned to certain fasts, prayers, and fines; but he eluded punishment by going to Florence. His free-thinking and plain-speaking, however, raised up many enemies; he had attacked Dante's *Commedia* and his fate was sealed; an old accusation of impiety was renewed, and he was tried, sentenced, and burnt at the stake in Florence, in the 70th year of his age.

CECIDOMY'IA (Gr. *kekidion*, a gall-nut; and *myia*, a fly or gnat), a genus of dipterous (two-winged) insects of the family *tipulariæ*—the gnat and mosquito family; having downy wings, which have three nervures, and are horizontal when at rest; antennæ as long as the body, with bead-like joints and whirls of hairs at the joints; long legs, and the first joint of the tarsi very short. The species are numerous; nearly thirty are British. All are of small size, but some of them are very important on account of the ravages which their maggots effect in grain-crops. *C. cerealis*, sometimes called the barley midge, a brownish-red fly with silvery wings, of which the maggot is vermilion-colored, is often very destructive to crops of barley and spelt in Germany. The little maggots live in families between the stalk and the sheath of the leaf, abstracting the juice of the plant.—The WHEAT-FLY (q.v. and the HESSIAN FLY (q.v.) belong to this genus.—Some of the species of C. deposit their eggs on the young buds of trees, which the larvæ transform into galls.

CECIL, a co. in n.e. Maryland, on the Delaware and Pennsylvania border, intersected by three railroads; 300 sq.m.; pop. '80, 27,108—4466 colored. It has an uneven surface and fertile soil, its products are wheat, corn, oats, potatoes, hay, butter, and wool. Of stone and minerals there are granite, gneiss, slate, iron, chrome, and sulphate of magnesia. There are flouring mills, and several other manufactories. Co. seat, Elkton.

CECIL, RICHARD, 1748–1810; a minister of the church of England, celebrated as a pulpit orator. His works have been published in England and in New York. They are prized for deep spiritual fervor.

CECIL, ROBERT, Earl of SALISBURY, son of WILLIAM, was b. about 1550. On the death of his father, having previously held important state offices, he succeeded to what would now be called the premiership. On the accession of James I., C., who had carried on a private correspondence with that monarch before Elizabeth's death, was confirmed in his office and received many high honors, culminating in that of earl of Salisbury. In 1608, he was made lord high treasurer, and the exchequer was greatly improved in his hands. C. was a man of immense energy and far-reaching sagacity, undoubtedly the best minister the country had in his time; but he was cold, selfish, and unscrupulous as to the means he took to gain his ends, and get rid of his rivals. His connection with the disgrace of Essex and Raleigh laid him open to great and deserved odium, in

the latter case especially. Like his father, however, he was free from the meanness and dishonesty of enriching himself out of the public money. He died May 24, 1612.

CECIL, William, Lord Burleigh, one of England's greatest statesmen, was b. at Bourne, Lincolnshire, Sept. 15, 1520. Educated at the grammar-schools of Grantham and Stamford, he thence passed to St. John's college, Cambridge, where he was remarkable alike for his diligence and aptitude in learning. Entering Gray's inn at the age of 21, he devoted himself assiduously to the study of law. History, genealogy, and theology also formed part of his studies at this time; and his knowledge of the last recommended him to the notice of Henry VIII., who presented him with the reversion of the *custos brevium*, an office of value in the common pleas. An alliance with the daughter of sir Anthony Cook procured him the friendship of the protector Somerset, who, in 1547, appointed him master of requests; and in the following year his great talents procured for him the office of secretary of state. He shared in the disgrace of Somerset, even to imprisonment for three months; but in less than two years after his release, his pre-eminent abilities secured for him a reappointment to the state secretaryship by the duke of Northumberland, his former patron's sworn enemy. During his second secretaryship, C. effected most important and beneficial changes in the commercial policy of the country. With a sagacity far beyond the spirit of his age, he endeavored to throw trade open, and did succeed in abolishing some monopolies; but others proved too strong for him, standing as he did alone, at a time when exclusive privileges were considered the only sureties of a profitable trade. When queen Mary ascended the throne, C., being a Protestant, resigned his official employment, because he could not conscientiously serve a Roman Catholic court; but as a private gentleman he maintained good relations with the Roman Catholic party, and was one of the few eminent Protestants who escaped in purse and person during that short but infamous reign. His freedom from persecution has given rise to the charge, that he was a "trimmer"—a very unjust accusation, indeed. C. was naturally cautious and politic, and averse to extremes in religion; but though he took no part in bitter sectarian discussions, he never belied his conscience, and to him is mainly owing the rejection of the bill which the Roman Catholics had introduced into parliament, with the view to a wholesale confiscation of the estates of Protestants. Prior to Mary's death, C., foreseeing her end, had entered into correspondence with Elizabeth, who, on her accession to the throne (Nov. 16, 1558), at once recognizing C.'s capacity for government, appointed him secretary of state. A biography of C. from this time until his death would be a forty years' history of England, for he was alike the originator and director of that policy which, hitherto, has made Elizabeth's reign memorable above that of any other English sovereign; for although Elizabeth occasionally, in her caprice, favored other courtiers, C. was the statesman whose judgment she relied on in all matters of consequence. His policy at home and abroad was at once shrewd and cautious, and also liberal and comprehensive, while he displayed a power of decision, ready and stern, when necessity demanded. As a statesman, C. was above animosities and favoritism; his enemies never suffered, and his friends profited nothing, by his power. Capacity, truth, and honor were what he sought in public men. Had he been less just, history might have been more generous to his memory. The queen created him baron Burleigh in 1571, and conferred on him the order of the garter in the succeeding year, when he was also made lord high treasurer, an office he held until his death, Aug. 15, 1598.

CECILIA, St., the patroness of music, is said to have suffered martyrdom in 230 A.D. Her heathen parents, as we are told, belonged to a noble Roman family, and betrothed their daughter, who had been converted to Christianity, to a heathen youth named Valerian. This youth and his brother Tiberius became Christian converts, and suffered martyrdom. C., when commanded to sacrifice to idols, firmly refused, and was condemned to death. Her persecutors, it is said, first threw her into a boiling bath, but on the following day they found her unhurt. The executioner next attempted to cut off her head, but found it impossible. Three days later, she died—rather a lame conclusion to such miraculous interference! As early as the 5th c., there is mention of a church dedicated to her at Rome; and in 821, by order of pope Paschal, her bones were deposited there. St. C. is regarded as the inventor of the organ, and in the Roman Catholic church her festival-day, Nov. 22, is celebrated with splendid music. Chaucer, Dryden, and Pope have celebrated St. C., and the painters Raphael, Domenichino, Dolce, and others have represented her in fine pictures.—Another St. C. was born in Africa, and suffered martyrdom by starvation under Diocletian. The Roman Catholic church celebrates her festival on the 11th of Feb.

CECRO'PIA, a genus of trees of the natural order *artocarpaceæ*. *C. peltata*, a native of the West Indies and of South America, sometimes called trumpet-wood and snake-wood, is remarkable for its hollow stem and branches, exhibiting merely membranous partitions at the nodes. The small branches, these partitions being removed, are made into wind-instruments. The wood is very light, readily takes fire by friction against a harder piece of wood, and is much used by the Indians for procuring fire in this way. The fruit is agreeable, and resembles a raspberry. Both the trunk and branches yield a large quantity of saline matter, which is employed by the French planters in the

purification of sugar. The bark is strong and fibrous, and is much used for cordage. It is also astringent, and is applied in diarrhea and other diseases.

CECRO'PIA MOTH, *Platysamia cecropia*, the largest moth of the United States; belonging to the family bembycidæ, it is akin to the silk-worm. Its larva grows to be between 3 and 4 in. long, and is a most beautiful object; its color is a tender green, shading into blue upon its sides; on its head it wears an amber-colored knob raised upon a short stem, and armed with short black points; rows of smaller knobs adorn the back and sides, those along the sides being turquoise blue; the foremost four on the back are amber-colored. The larva feeds upon nearly all kinds of fruit trees, the maple, willow, and some other trees. It spins a large cocoon, sometimes attached to the under-side of a twig, when it is closely woven and tapers to a point at each end; sometimes in the space between forking limbs, when it is loosely made, and is often as large as a goose-egg. The outer and inner surfaces of the cocoon are somewhat condensed, so that there appear to be two cocoons or coverings. In the earlier stages of the spinning, the insect often thrusts the silk in loops through the openings between the threads, and these loops make it difficult to reel the silk; by dissolving in an alkali the gum which the insect exudes to harden the cocoon, and by using great care, it is possible to reel the silk, but it is dark and coarse, and would be fit for only coarse and strong fabrics. It has been carded and spun. The larva does not thrive in confinement, but might be cultivated in the open air with a little pains. The moth appears in June; its wings expand from 5 to 7 in.; its general color is dark brown thickly powdered with gray; the borders of the wings are clay-colored, and each wing bears a light gray kidney-shaped spot, bordered with lines of red and black. The antennæ of the males are particularly large and fine, the main stem being feathered on each side with long branches in pairs. Like other lepidopterous larvæ, the cecropia is preyed upon by various parasites, two species of ichneumon flies being notable.

CE'CROPS, the first king of Attica, figures in Greek mythology as an autochthon (q.v.), half-man and half-dragon. Belonging, as he does, to the prehistoric ages of Greece, his real character can only be guessed at. Tradition declared him to be the founder of marriage, the author of the political division of Attica into twelve states, and the introducer of agriculture, of navigation, and commerce. He is also said to have civilized the religious rites of the people. The name C. is given to various towns in Greece, and the legends in general seem to indicate a Pelasgic origin for the hero. The later accounts, that he came from Sais in Egypt, have no historic basis.

CEDAR, a co. in e. Iowa, watered by Cedar and Wapsipinicon rivers, and intersected by the Chicago, Rock Island and Pacific, and the Chicago and Northwestern railroads; 576 sq.m.; pop. '80, 18,937. The surface is divided between woodland and prairie; the productions are mostly agricultural. Co. seat, Tipton.

CEDAR, a co. in s.w. Missouri, on Sac river; 435 sq.m.; pop. '80, 10,757—146 colored. The surface is uneven, but the soil is productive. Agriculture is the chief business. Co. seat, Stockton.

CEDAR, a co. in n.e. Nebraska, on the Missouri river, watered chiefly by Bow creek; 650 sq.m.; pop. '80, 2899. It is an agricultural region, but as yet not much cultivated. Co. seat, St. James.

CEDAR, BARBADOES, *Cedrela odorata*, a tree of the natural order *cedrelaceæ* (q.v.), and of the same genus with the toon of India, a native of the West Indies and warm parts of America. It is simply called C. in the West Indies. It is often upwards of 80 ft. high, with a trunk remarkable for thickness. It has panicles of flowers resembling those of the hyacinth. The fruit, bark, and leaves have the smell of asafœtida, but the wood has an agreeable fragrance. Being soft and light, it is used for canoes, and for shingles. Havana cigar-boxes are very generally made of it. In France, it is used in making black-lead pencils.

CEDAR, or CEDAR OR LEB'ANON, a tree much celebrated from the most ancient times for its beauty, its magnificence, and its longevity, as well as for the excellence and durability of its timber. It is often mentioned in Scripture; it supplied the wood-work of Solomon's temple; and in the poetry of the Old Testament it is a frequent emblem of prosperity, strength, and stability. It belongs to the natural order *coniferæ*, and is the *pinus cedrus* of the older botanists; but is now ranked in the genus *abies* (see FIR), in the genus *larix* (see LARCH), by those who make *larix* a distinct genus from *abies*, or is made the type of a genus, *cedrus*, distinguished from *larix* by evergreen leaves and carpels separating from the axis, and receives the name of *C. libani*.

Of the celebrated CEDARS OF LEBANON, only a few now remain. They consist of a grove of some 400 trees, about three quarters of a mile in circumference, partly old trees and partly young ones. Learned travelers think that most of the trees in the grove may be 200 years old, and several between the ages of 400 and 800 years. There are 12 trees whose age is incalculable—seven standing very near each other; three more a little further on, nearly in a line with them; and two, not observed by any recent traveler except lord Lindsay, on the northern edge of the grove, The largest of these two is 63 ft. in circumference—following the sinuosities of the bark; one of the others measures 49 feet.

These trees are more remarkable for girth than stature, their height hardly exceeding

50 feet. Their age is variously estimated; the rules by which botanists determine the age of trees are not applicable to them, for their stems have ceased to grow in regular concentric rings; they owe their prolonged existence to the superior vitality of a portion of their bark, which has survived the decay of the rest. Russeger is inclined to admit that these trees may possibly number some 2,000 years.

The Arabs, of all creeds, have a traditional veneration for these trees; they believe that an evil fate would surely overtake any one who shall dare to lay sacrilegious hands on the *saints*, as they fondly call them. Every year, at the feast of the transfiguration, the Maronites, Greeks, and Armenians mount to the cedars, and celebrate mass on a homely altar of stone at their feet.

The C. has been planted in parks in many parts of Europe; it was introduced into England in the latter part of the 17th c., and a tree at Sion house, London, is now 8 ft. in diameter at 3 ft. above the ground. Even in Inverness-shire it succeeds so well, that trees at Beaufort castle, the seat of lord Lovat, planted in 1783, are now 3 or 4 ft. in diameter, On its native mountains, the C. is found at the base of the highest peaks, at an altitude of about 8,000 ft. above the sea. It seems to delight in a dry open soil, where, however, its roots can have access to abundance of water. Although in foliage and some other particulars the C. considerably resembles the common larch, it differs in form and habit very widely both from the larch and from the pines in general. Its stem bears almost down to the ground irregularly placed branches, often of prodigious size and expanse, which divide irregularly into branchlets. The leaves are dark green, 10 to 15 lines long, pointed, united in clusters of 20 to 30: on the young shoots they are very numerous, and not in clusters; the small branchlets also are crowded together and pensile. The cones are erect, oval, broadly rounded at both ends, about 4 in. long, and 3 in. in diameter; their scales closely crowded, large, and broad. The cones take two years to come to maturity, and hang on the tree for years before their scales come off and their seeds are set free. The wood of the trunk is reddish, and full of a fragrant resin. The ancients kept their writings in cabinets or boxes of cedar-wood. Extraordinary indestructibility and other virtues were ascribed to it. It is not nearly so much prized at the present day, because it is soft and light, and apt to crack in drying. This inferiority is, however, not improbably owing to the inferior age of the trees from which the timber is now procured. A resinous substance, called *cedar resin*, or *cedria*, flows spontaneously from the trunk of the C., or from incisions; it resembles mastic, and was anciently used, along with other resins, in the embalming of the dead. It was also used as a medicine. In very ancient times, C. Oil, a kind of turpentine, was prepared from the wood, and was spread on books in order to their better preservation. At the present day, the oil and the resin are scarcely known. The branches of the C., like those of the larch in warm countries, exude a sweet substance, which is known by the name of C. Manna.—The Deodar or Himalayan C. (*cedrus deodara*), a tree held in great veneration by the Hindus, and of which the name is said to be properly *devadara*, and to signify *god-tree*, is common in the Himalaya mountains, at elevations of 7,000 to 12,000 ft., forming magnificent forests, and attaining a great size, a height sometimes of 150 ft., with a trunk 30 ft. or more in circumference, an ample head, and spreading branches. It is described as having cones somewhat larger than those of the C. of Lebanon, the scales of the cones falling off as soon as the seed is ripe, and as differing from the C. of Lebanon also in more pensile branches and longer leaves; but Dr. Hooker expresses a strong opinion that they will prove to be really the same species; as well as the C. of Algiers (*C. Atlantica* or *Africana*), which is found in the mountainous regions of the n. of Africa. The wood of the deodar is resinous, fragrant, compact, and very durable. It is susceptible of a high polish, and in its polished state has been compared to brown agate. Owing to the abundance of resin, laths of it burn like candles. Its turpentine is very fluid, and although coarse, is much used in India for medical purposes; and tar and pitch are obtained from the trunk. The deodar has now become very common as an ornamental tree in Britain, although few specimens have yet attained a very considerable size. On account of its extreme gracefulness when young, it is often planted in situations to which large trees are unsuitable, and is to be seen in many suburban parterres.—The name C. is often given to other coniferous trees besides the true cedars. Thus, the Siberian stone pine, or Cembra pine, is called the Siberian C. (see Pine), and a species of fir (*abies religiosa*) is the Red C. of California (see Fir). A species of cypress (q.v.) is known as White C., and another as the C. of Goa. Several of the trees which bear the name C. are species of juniper (q.v.), among which are the Virginian C., or Red C. of North America, and the Bermuda C.—which yield the cedar-wood used for pencils—the Spanish C. of the s. of Europe, etc. The name C. is even given to trees which have no resemblance to the true cedars, except in the resinous quality of the wood; thus the cedar-wood of Guiana is produced by *icica altissima*, a tree of the natural order *amyridaceæ* (q.v.); the C. of the West Indies (see next article) belongs to the natural order *cedrelaceæ;* and the name Bastard C. is given in India to a tree of the natural order *byttneriaceæ* (q.v.).

CEDAR BIRD. See Waxwing

CEDAR CREEK, a stream in Shenandoah co., Va., falling into the Shenandoah river. On this creek, Oct. 19, 1864, the confederates, under gen. Early, surprised Sheri-

dan's (union) camp, during that officer's absence. The unionists were compelled to retreat. Gen. Sheridan, who was at Winchester when he heard of the disaster, hastened to the front, and, rallying his forces, in turn surprised the confederates who had stopped to plunder the union camp, recovered nearly all that had been lost, took 2,000 prisoners, and 50 pieces of artillery, and the next day cleared the valley of the Shenandoah of confederate troops. This brilliant achievement was the theme of T. Buchanan Read's stirring poem, *Sheridan's Ride.*

CEDAR FALLS, a city in Black Hawk co., Iowa, on Cedar river and the Iowa division of the Illinois Central, at the intersection of the Burlington, Cedar Rapids and Minnesota railroads, 93 m. from Dubuque. It is a manufacturing place of importance. Pop. '80, 3,035.

CEDAR HILL, S. Car. See page 891.

CEDAR MOUNTAIN, a hill in Culpepper co., Va., near which, Oct. 9, 1862, there was an engagement between the federal forces under gen. Banks and the confederates led by gen. Jackson. The confederates had the advantage and held the field, but two days later fell back towards Gordonville to join gen. Lee. The reported losses were· On the union side, 1400 killed and wounded, and 400 prisoners; of the confederates, 1283 killed and wounded, and 31 missing.

CEDAR MOUNTAINS, a range of the Cape colony, parallel with the Atlantic, and nearly half way between it and the dividing ridge of the country. They form the height of land between the Oliphant on the w., and the Great Thorn, its principal tributary, on the e., varying in altitude from 1600 ft. to 5,000. They lie about lat. 32° s., and long 19° e., in the division of Clanwilliam, and supply the village of that name with cedar planks.

CEDAR RAPIDS, a city in Linn co., Ia., on Red Cedar river, and the Burlington, Cedar Rapids, and Minnesota railroad, at the intersection of the Iowa division of the Chicago and Western railroad, and the junction of the Dubuque and Northwestern railroad. There are many important manufactories in and near the place. Pop.'80, 10,104.

CEDAR, or RED CEDAR, RIVER, rises in s.e. Minnesota, and flows s. and s e. through more than three quarters of the breadth of Iowa, falling into the Iowa river about 20 m. e. of the Mississippi. The entire length is about 350 miles.

CEDAR SPRINGS, a village in Spartanburg co., S. C., formerly a popular watering-place. It is now the seat of a deaf and dumb asylum. The village is on the Spartanburg and Union railroad, in Beech Springs twp., and is now called Cedar Hill.

CE'DRATE. See CITRON.

CEDRELA'CEÆ, a natural order of exogenous plants, very nearly allied to *meliaceæ* (q.v.), and chiefly distinguished by the winged seeds, numerous in each cell of the fruit, which is a capsule. The known species are few, all tropical or sub-tropical trees or shrubs, with pinnate leaves, most of them trees valuable for their timber. To this order belong mahogany, satin-wood, toon, Barbadoes cedar, the yellow-wood of New South Wales, etc. The barks of some species are febrifugal. That of *soumida febrifuga,* the Rohuna or East Indian mahogany, has been imported into Britain as a medicine.

CEDRON, an extract of a bitter nature from a small tree growing in Central and South America. In those countries the bitter is thought to be a remedy for the bite of serpents, and a prophylactic against hydrophobia. In medical practice it is used as a simple bitter principle.

CEFALU', a t. of Sicily, on the n. coast, 47 m. e.s.e. of Palermo. It is situated at the foot of a rock, and is surrounded by old walls. It has a cathedral, and the ruins of a Saracenic castle occupy a neighboring hill. As a seaport, it has little traffic. The inhabitants, numbering some 10,000, are chiefly engaged in fishing.

CEFALU', a seaport in n. Sicily, 39 m. e.s.e. of Palermo; pop. 10,200. The new town, founded in 1131 by Roger I. of Sicily, is at the base of a steep promontory which overlooks the magnificent bay of Cefalu. The houses are well built, and the cathedral, begun in 1132, is distinguished for the beauty of its façade, with antique pillars and mosaics. There is a small but good harbor, and some trade in manna, oil, and sardines; but most of the people are engaged in the sea-fishery.

CEG'LIE, a t. in southern Italy, province of Lecce, 18 m. n.e. of Taranto. Pop. about 12,580. It produces much grain, and has fine pastures.

CEHEGIN', a t. of Spain, in the province of Murcia, 37 m. w.n.w. of the city of that name. It has some spacious streets, with handsome buildings, and manufactures of paper, cloth, and pottery. Pop. about 10,000.

CEILING (Fr. *ciel;* Lat. *cœlum,* heaven). This term seems to have been suggested by the use of arched coverings for churches, and even for rooms, which prevailed in the middle ages, and was not unknown to the Romans. Whether the term was further suggested by the habit of tinting ceilings of a blue color, and decorating them with stars, or whether that usage arose from the use of the term already introduced, is more doubtful. Arched ceilings among the Romans were known by the name *cameræ* or *camera,* the Greek origin of which seems to furnish an argument in favor of the view that the arch was known to the latter people. The camera was formed by semicircular beams of wood, at small distances from each other, over which was placed a coating of lath and

plaster. In later times, the cameræ were frequently lined with plates of glass; whence they were termed *vitreæ*. But the ceilings most commonly in use amongst the Romans were flat, the beams, as in modern times, having been at first visible, and afterwards covered with planks and plaster. Sometimes hollow spaces were left between the planks, which were frequently covered with gold and ivory, or paintings. The oldest flat C. in existence is believed to be that of Peterborough cathedral. Like that at St. Alban's abbey, it is made of wood, and plastered over like a modern ceiling. Ceilings of churches, in the middle ages, were generally painted and gilded in the most brilliant manner; and many existing ceilings still exhibit the traces of early decoration of this kind. The older ceilings generally follow the line of the timbers of the roof, which, in the early English and decorated, are often arranged so as to give the shape of a barrel vault. In ceilings of this description there are seldom many ribs, often only a single one along the top. In the perpendicular style, the C. often consists of a series of flat surfaces or cants, formed on the timbers of the roof. Though sometimes altogether destitute of ornament, they are more frequently enriched with ribs, dividing them into square panels, with bosses (q.v.) or flowers at the intersections. Wooden ceilings are sometimes formed in imitation of stone-groining, with ribs and bosses, examples of which will be found at York, Winchester, and Lincoln. In the Elizabethan age, ceilings were generally of plaster, but they were ornamented with ribs having bosses or small pendants at the intersections. It is not unusual for the C. immediately over the altar, or the roodloft, to be richly ornamented, whilst the rest is plain.

CELANDINE, *Chelidonium*, a genus of plants of the natural order *papaveraceæ* (the poppy family), having a corolla of four petals, and a podlike capsule. The common C. (*C. majus*) is a perennial, with pinnate leaves, lobed leaflets, and yellow flowers in simple umbels, frequent under hedges, in waste places, etc., in Britain and most parts of Europe. It flowers from May to Sept. The root, stem, and leaves, when fresh, have a disagreeable smell, and are full of a yellow juice, which is very acrid, causing inflammation when applied to the skin. C. is sometimes used in medicine: it is a drastic purgative, and in large doses an active poison; in small doses it is said to act beneficially on the lymphatic system and on the organs of secretion, and to be useful in scrofulous diseases, disease of the mesenteric glands, etc. The fresh juice, applied externally to warts, corns, etc., removes them by stimulating them beyond what their languid vital powers can bear. Mixed with milk, it is applied to the eye for the cure of opacities of the cornea, but is a remedy that requires great caution in its use.

CELA'NO, Lake of. See Fucino, Lake of.

CELASTRA'CEÆ. See Spindle-tree.

CEL'EBES, a large island in the Eastern archipelago, e. of Borneo, between 5° 45′ s. lat., 1° 45′ n. lat., and 118°, 126° e. longitude. Area, 37,485 sq. miles. It is irregular in shape, and four peninsulas springing from a common root form the large bays of Gorontalo and Tolo, and the gulf of Boni. C. is covered with mountains and valleys: a chain running throughout it sends spurs into the peninsulas. Some are active volcanoes, and earthquakes are frequent. The peak of Bonthaim is 9,788 ft. high. The island has a rich soil and extensive pastures. The vegetable kingdom gives sago, cocoa-nuts, bread-fruit, coffee, tamarinds, bananas, oranges, pine-apples, maize, rice, tobacco, sugar-cane, indigo, sandal-, sapan-, and ebony-wood. The animals include excellent horses, buffalo, cattle, wild swine, elands, goats, sheep, parrots, lories, birds of paradise, beautiful butterflies, wild bees, etc. The minerals are gold, iron, coal, and salt. The people spin and weave cottons. Pop., of various races, is reckoned at 3,000,000, of whom (1874) 568,338, including 2,000 Europeans, are under Dutch rule. The chief t. is Macassar, which names the strait between C. and Borneo. In Nov., 1874, a fire destroyed 774 houses of the town.

CEL'EBES (*ante*), was first discovered by the Portuguese in the early part of the 16th c., the exact date being given by some authors as 1512. At that time the Macassars were the most powerful people in the island, having successfully defended themselves against the king of the Moluccas and the sultan of Ternate. In 1609, the English endeavored to gain a foothold. The Dutch arrived near the end of the 16th or the beginning of the 17th century. In 1611, the Dutch East India company obtained a monopoly of the trade on the island of Buton, and in 1618, an insurrection in Macassar gave them an opportunity of obtaining a definite settlement in Celebes. In 1660, the native kingdom was forcibly subjugated by the Dutch, with 33 ships, and 2,700 men. Six years later, the war began again, but was ended in 1667, and a treaty was signed by which the Dutch were recognized as protectors and mediators of the different states who were parties to the treaty. In 1683, the n.e. part of the island was conquered and put under the command of the governor of the Moluccas; and in 1824, the kingdom of Boni was reduced. Since that time there has been no important military event except the speedily suppressed insurrection in Boni in 1859. The island is very irregular in outline, and has been compared to a star-fish with its limbs torn away from the w. side. There are few rivers, and none are navigable for any considerable distance; but the lakes are numerous, and some of them large. The most important of these is the Tamp-arang-Labaya, or Tempe, in the s.e. section of the peninsula. It has a depth of 30 ft., and is richly stocked with fish.

The scenery throughout the island is varied and picturesque. There are wonderful gorges, chasms, and precipices, many of the latter 600 ft. high, and yet covered with a tapestry of vegetation. Much of the country is still covered with the primeval forest, which is traversed here and there by scarcely perceptible paths, or broken by occasional clearings or villages. The fauna of Celebes exhibits some specimens peculiar to the island. Of 200 species of birds, 80 are not elsewhere found. There are only 14 species of mammalia, and of these 11 are almost entirely confined to the area. The most remarkable of these are an ape found in but one other country, a small ox-like quadruped that inhabits the mountainous districts, and the pig-deer of the Malays. Neither the elephant, the tapir, the rhinoceros, nor any large beast of prey is represented. Not much attention has been given to agriculture, except where the Dutch influence and example are strong; and manufactures are few and crude. The women weave a tolerable cotton cloth. The houses are of wood and bamboo, and are usually very frail. The whole of Celebes is practically in the hands of the Dutch government, though but a comparatively small portion is under their direct administration, and many of the petty princes are permitted to manage their internal affairs much as they please. For administrative purposes there are three "residences," Celebes, Manado, and Ternate, the former two belonging solely to the island, while the third includes a large part of the Moluccas, The most important and interesting people in the island are those in the department of Macassar. They consist mainly of Macassars and Malays proper, of Endinese from the island of Flores, and immigrants from the neighboring kingdom of Wadjo. The foreign colonies are each under the management of a separate captain, and the Malays are under the care of a head priest. The Macassars belong to the Malay race; they are well built and muscular; with dark brown complexion, a broad and expansive face, black and sparkling eyes, high forehead, nose rather flat, large mouth, and black soft hair which they let fall over their shoulders. The women are sprightly, clever and amiable, and formerly brought large prices as slaves. The men are brave, ambitious, jealous, and revengeful, but not treacherous. Drunkenness is rare, but gambling and cock-fighting are passionately engaged in. Running "amok" was once so common that the Dutch dismissed the Macassar soldiers from their service to break up the evil. They take great pleasure in all bodily exercise. In religion they call themselves Mohammedans, but their worship is full of pagan superstitions; they worship animals and a divinity called Kareng Lové, who has power over their fortune and health. Their language, which belongs to the Malayo-Javanese group, is spoken by about 300,000; but it has a much smaller area than Buginese, which is the language of Boni. Their literature is poor, and consists mainly of romantic stories from the Malay, and religious treatises from the Arabic. Of their few original works the most important are the early histories of Goa, and some other states of the Celebes, and a collection of laws and maxims of the old princes and sages. In no part of their possessions, however, have the Dutch made more important transformations than in Minahassa, or the confederation of Manado. At the beginning of the century the people were still savages, and in almost continual warfare among themselves. About 1822, it was discovered that the soil of the mountain sides was very favorable for growing coffee; the cultivation was introduced, and a system established by which the native chiefs undertook the management of the plantation. The result has been not only to make one of the best coffee districts in the archipelago, but wonderfully to advance the civilization of the inhabitants. Missions and education have been successful; villages of handsome houses have grown up; the country is traversed by roads shaded by trees, and rivers have been bridged. The trade of the district is in a flourishing condition, and promises to become still more important. The coffee plant produces a fine kernel of transparent greenish-blue color, and brings a much higher price than that from Java. Besides other large district divisions, for the most part physically similar to those described, there is the district or state of Toradja, lying entirely inland, which is in possession of a wild pagan race who shun intercourse with other races, and are generally regarded as the aborigines of the island.

CEL'ERES, a body-guard of 300 young men of the best Roman families, organized, according to tradition, by Romulus. Next to the king, their leader was the highest officer of the state. This position was held by Brutus when he expelled the Tarquins.

CELERY, *Apium*, a genus of plants of the natural order *umbelliferæ*, distinguished by a mere rudimentary calyx, roundish entire petals, very short styles, and roundish fruit. The common C. (*A. graveolens*) is found wild in Britain and most parts of Europe, in ditches, brooks, etc., especially near the sea and in saline soils. Its leaves are dark green and smooth, its petals involute at the tip. The wild plant, also called SMALLAGE, has a stem about 2 ft. high, a tapering slender root, a penetrating offensive odor, a bitterish acrid taste, and almost poisonous qualities. By cultivation, it is so much changed that its taste becomes agreeably sweetish and aromatic, whilst either the leaf-stalks much increase in thickness, or the root swells in a turnip-like manner. These parts, blanched, are much used as a salad, or to impart flavor to soups, etc., and sometimes as a boiled vegetable. They contain sugar, mucilage, starch, and a substance resembling manna-sugar, which acts as a stimulant, particularly on the urino-genital organs, so that a very free and frequent indulgence in the use of C. cannot, in ordinary circumstances. be altogether favorable to health. Two principal varieties of C. are cul-

tivated. that most common in Britain having long thick leaf-stalks, which are more or less tubular, sometimes almost solid, and, after blanching, either white or more or less tinged with red; whilst the other, called TURNIP-ROOTED C., or CELERIAC, is chiefly remarkable for its swollen turnip-like root, and is in most general cultivation on the continent of Europe. The "red" varieties of C. are esteemed rather more hardy than the "white." The blanching of the leaf-stalks is generally accomplished by drawing up earth to the plants, which are transplanted from the seed-bed into richly manured trenches; and as they grow, the trenches are filled up, and the earth finally raised into ridges, above which little more than the tops of the leaves appear. C. is thus obtained for use throughout the winter. In the northern parts of Britain, the seed is generally sown on a hot-bed. C. seed is often used for flavoring, when the leaf-stalks cannot be obtained.—Another species of C. (*apium australe*) grows abundantly in wet places on the shore about cape Horn and in Staten island. It is a large, hardy, and luxuriant plant, and is described as wholesome and very palatable, nearly equal in its wild state to our garden-celery. It seems well worthy of the attention of horticulturists.

CÉLESTE, MADAME, b. 1814; a dancer and melodramatic actress of French descent, and a pupil of the Paris conservatory. She came to the United States about 1829, and not long after married a man named Elliot. After his death she went to England, and in 1830 began a career of remarkable success in the sensational drama of *The French Spy*. She made two other American tours, 1851 and in 1865. In 1866, she returned to England and retired from the stage. She d. 1882.

CEL'ESTINE, a mineral bearing the same relation to strontia (q.v.) that heavy spar bears to baryta. It is essentially sulphate of strontia ($StOSO_3$), with occasional admixture of sulphate of baryta, carbonate of lime, oxide of iron, etc., in small proportions. It much resembles heavy spar, but is not quite equal to it in specific gravity; is usually blue, often of a very beautiful indigo-blue; sometimes colorless, more rarely reddish or yellowish. Its crystallization is rhombic, like that of heavy spar. Most beautiful specimens of crystallized C. are found in Sicily. C. derives its name from its color. It is used as a source of strontia.

CEL'ESTINE, the name of five popes. 1. SAINT CELESTINE, d. 432, is supposed to have been a near relative of the emperor Valentinian. He held the council of Ephesus in 431, at which the Nestorians were condemned; actively persecuted the Pelagians; struggled for Roman orthodoxy; sent Palladius to Scotland, and Patricius (St. Patrick) to Ireland; raged against the Novatians in Rome, imprisoning their bishop, and forbidding their worship, and was intolerant of the least innovation of the constitutions of his predecessors. His papacy lasted nearly 8½ years. 2. GUIDO DI CASTELLO, chosen in 1143; d. 1144, after a reign of 5 months and 13 days. He gave absolution to Louis VII. of France, on the king's humble subjection, and removed the papal interdict from that country. 3. GIACINTO BOBONE ORSINI, elected Mar. 30, 1191; d. 1198, after ruling nearly 9 years, and was buried in the Lateran; supposed to have been 90 years old when chosen. He crowned the emperor Henry VI. of Germany, and subsequently excommunicated him for keeping Richard I. of England in prison. In 1192, he confirmed the statutes of the Teutonic order of knights. 4. GOFFREDO CASTIGLIONE of Milan, a nephew of Urban III. He was elected pope by only seven cardinals, Sept. 22, 1241, and occupied the chair only 17 days, dying Oct. 8, before he was consecrated. He was the author of a history of Scotland, in which country he was once a monk. 5. PIETRO DA MORONE, the son of a peasant of Naples; became a Benedictine monk, and lived many years in caves after the manner of John the Baptist. Terrible stories are told of the severity of his penitential discipline. During his hermit life he founded the order that bears his name (see CELESTINES, *ante*). After the death of Nicholas IV. he was elected pope, but refused to accept until persuaded by a deputation of cardinals reinforced by the kings of Naples and Hungary. He was chosen July 7, 1294, was crowned Aug. 29. He issued two decrees; one confirming that of Gregory X. ordering the shutting up of the cardinals when in conclave, and one declaring the right of any pope to abdicate at pleasure—a right which, after ruling 5 months and 8 days, he exercised, Dec. 13, 1294. In his document of renunciation he assigned as the moving causes "the desire for humility, for a purer life, for a stainless conscience; the deficiencies of his own physical strength; his ignorance, the perverseness of the people, and his longing for the tranquillity of his former life." Having divested himself of every outward symbol of dignity, he returned to his old solitude; but he was not permitted to remain; his successor, Boniface VIII., sent for him, and, despite his efforts to escape, imprisoned him in a castle, where, after languishing ten months in the infected atmosphere, he died, May 19, 1296. He, like the first of the name, is recognized as a saint by the Roman church.

CEL'ESTINES, an order of hermits of St. Damianus, founded by Peter de Morrone about 1264, and confirmed as a monkish order by Urban IV. in 1264 and 1274. They called themselves C. when their founder ascended the papal chair under the name of Celestine V. They are regarded as a branch of the great order of St. Benedict, whose rule they follow; they wear a white garment with black hood and scapulary, and live a purely contemplative life. In the 13th and 14th centuries, the order rapidly spread through France, Italy, and Germany, but subsequently decayed. The French C. were

secularized by order of pope Pius VI. in 1776–78; so also were the Neapolitan Celestines. In the present day, the order is almost extinct.

CELIBACY, from Lat. *cælebs*, unmarried. Notwithstanding the divine commendation of marriage given in the Jewish Scriptures (Gen. i. 28), the opinion had become prevalent, even before the time of Christ, that C. was favorable to an intimate union with God. This notion took its origin in the wide-spread philosophy of a good and an evil principle. The body, consisting of matter, the seat of evil, was looked upon as the prison of the pure soul, which was thought to be defiled by bodily enjoyments. Among the Jewish sect of the Essenes, accordingly, a life of C. was held to be the chief road to sanctity. These ascetic views naturally led, in the first place, to the disapproval of second marriages. While, therefore, in the first Christian churches, every one was left at liberty to marry or not as he thought fit, the objection to those who married a second time had become so generally spread, that the apostle Paul saw occasion to counsel such Christian converts as were in widowhood to remain so.

By the 2d c., however, the unmarried life generally had begun to be extolled, and to be held necessary for a life of sanctity, although several, at least, of the apostles themselves had been married. Two passages of Scripture (1 Cor. vii. and Rev. xiv. 4) were specially cited as proving that C. was the genuine condition of a Christian; and with the platonizing fathers of the 2d and 3d centuries, the unmarried of both sexes were held as standing higher than the married. Accordingly, although there was no express law against the marriage of the clergy, many, especially of the bishops, remained unmarried; a second marriage was, in their case, already strictly prohibited.

As the bishops of Rome rose in consideration, and gradually developed a firmer church government, they called upon all who belonged to the clerical order to live for the church alone, and not marry. This requirement met with constant resistance; still, it became more and more the custom, in the 4th c., for the higher clergy to refrain from marriage, and from them it went over to the lower orders and to the monks. Provincial synods now began expressly to interdict the clergy from marrying. The council of Tours (566) suspended for a year all secular priests and deacons who were found with their wives; and the emperor Justinian by an edict declared all children born to a clergyman, after ordination, to be illegitimate, and incapable of inheritance. There were still, however, many married priests who resisted the law, and found encouragement in the opposition which the Greek church made to that of Rome in this matter of celibacy. The council held at Constantinople in 692, declared, in opposition to the church of Rome, that priests and deacons might live with their wives as the laity do, according to the ancient custom and ordinance of the apostles. The orthodox Greek church has continued to adhere to this decision. Priests and deacons in that church may marry before ordination, and live in marriage after it; but they are not allowed to marry a second time. However, only a priest living in C. can be chosen as bishop or patriarch.

The Church of Rome continued its endeavors to enforce the law of C.; though, for several centuries they were attended with only partial success. There still continued to be numbers of priests with wives, although the councils were always issuing new orders against them. Popes Leo IX. (1048–54) and Nicolas II. (1058–61) interdicted all priests that had wives or concubines from the exercise of any spiritual function, on pain of excommunication. Alexander II. (1061–73) decreed excommunication against all who should attend a mass celebrated by a priest having a wife or concubine. This decision was renewed by Gregory VII. in a council held at Rome in 1074, and a decretal was issued that every layman who should receive the communion from the hands of a married priest should be excommunicated, and that every priest who married or lived in concubinage, should be deposed. The decree met with the most violent opposition in all countries; but Gregory succeeded in carrying it out with the greatest rigor; and though individual instances of married priests were still to be found in the 12th and 13th centuries, the C. of the Roman Catholic clergy was established, and has since continued both in theory and practice.

The violence thus done to human nature did not fail to avenge itself in those rude times. The licentiousness and corruption of the priests and monks became in many cases boundless, and it was in vain that strict individuals, as well as councils, strove against it. The immorality and debasement of the clergy became a reproach and by-word in the mouth of the people, and gave a powerful impulse to the religious movement that began in the 16th century. The leading reformers declared against the C. of the clergy as unfounded in Scripture, and contrary to the natural ordinance of God, and Luther set the example of marrying. This was not without effect on the Roman Catholic clergy, and the question of the abolition of C. was raised at the council of Trent (1563). But the majority of voices decided that God would not withhold the gift of chastity from those that rightly prayed for it, and the rule of C. was thus finally and for ever imposed on the ministers of the Roman Catholic church. Those who have only received the lower kinds of consecration may marry on resigning their office. For all grades above a subdeacon, a papal dispensation is necessary. A priest that marries incurs excommunication, and is incapable of any spiritual function. If a married man wishes to become a priest, he receives consecration only on condition that he separate from his wife, and that she of her free will consent to the separation and enter a religious order, or take the

vow of chastity. The priests of the united Græco-Catholic congregations in Rome have received permission from the popes to continue in marriage, if entered into before consecration, but on condition of always living apart from their wives three days before they celebrate mass.

Notwithstanding these decisions, the contest against clerical C. has again and again been resumed, in recent times, both within and without the Roman Catholic church. In fact, all attempts at innovation within the bosom of Catholicism, connect themselves with the attack on C., the abolition of which would deeply affect the constitution and position of that church. So far back as 1817, the Catholic faculty of Tübingen expressed the opinion that compulsory C. was one of the chief causes of the want of Catholic ministers. In 1826, the Catholic clergy of Silesia put in petitions to the bishop for the abolition of C.; and unions were afterwards formed in Baden, Würtemberg, Bavaria, Silesia, and Rhenish Prussia, which, along with alterations in the doctrines and ritual of the Romish church, combined attacks on the prohibition of marriage to the clergy. A work was also published, entitled *The Introduction of Compulsory Celibacy among the Christian Priesthood, and its Consequences* (Altenb. 1828, new ed. 1845), which excited great attention. At last the abolition of the law came to be discussed in the legislatures of Baden, Saxony, and other countries. The church claimed this subject as belonging exclusively to her jurisdiction, and not to that of the state; and in Würtemberg the clergy induced the government to suppress the anti-celibacy society; but this only made their opponents in the press the more zealous. In France, also, the question, about 1829, was eagerly discussed. And in Spain, the academy of ecclesiastical science took the subject into consideration in a meeting held in 1842; while the Portuguese chambers had previously, in 1835, discussed it, though without result. The same took place in Brazil, about 1827.

During the commotions of 1848, the subject was again brought into prominence in Germany. The German Catholics (q.v.) had already abolished C.; and a general measure was called for in the Frankfort parliament, in the Prussian assembly, and in the press. In Austria, also, voices were raised against it; but here the state took the side of the pope, who, in a bull of 1847, had added fresh stringency to the rule of C., and condemned its infringement. See BACHELOR.

CELL (Lat. *cella*, from *celo*, to conceal). The Latin word had nearly all the significations which we attach to the English one, and a good many besides which we have not borrowed. For example, the whole space between the walls of an ancient temple was called the *cella*. But the interior was frequently divided into several cellæ, in which case each C. took the name of the deity whose statue it contained, and was called the C. of Jupiter, Juno, Minerva, and the like. In these cases, the word approached to its general meaning, which, with the Romans as with us, was that of a store room, or small apartment where objects of any kind were stowed away. In modern architecture, the term vaulting C. signifies the hollow space between the principal ribs of a vaulted roof.

CEL'LARER, a person under the Roman emperors who supervised the domestic affairs of the household and examined accounts. The same title was given in later times to the purveyors for monasteries or priests. As an officer of a monastery the C. regulated every matter affecting provisions.

CEL'LÉ, or ZELL, a t. of Hanover, on the left bank of the Aller, which at this point becomes navigable, 23 m. n.e. of the city of Hanover. It is situated in the midst of a sandy plain, well built, and has a palace with a garden, in which Matilda, sister of George III., is buried. Pop. '75, 18,163. The inhabitants are very industrious. The chief manufactures are linen, hosiery, tobacco, wafers, soap, etc. An active commerce is also carried on by the Aller, and by railway.

CELLI'NI, BENVENU'TO, a celebrated Italian gold-worker, sculptor, founder, and medailleur, remarkable not only for his skill as an artist, but also for his checkered life, was b. at Florence in the year 1500, and first displayed skill as a chaser and gold-worker. His autobiography is a remarkably curious and interesting work, presenting us with a complete picture of the author's life and character; his activity, his extraordinary weaknesses, the impetuosity of his passions, the perilous circumstances in which his quarrelsome disposition placed him (for C. thought nothing of committing manslaughter in a moment of rage), and the ludicrous vanity and credulity which are never absent from him. The book is also of great value in a historico-social point of view, but does not impress us favorably in regard either to the personal or social morals of the time.

At an early period, having been banished from Florence in consequence of an "affray," C. went to Rome, where he was employed by many distinguished patrons of art, but afterwards was allowed to return to Florence. Another "affray" compelled him to flee to Rome a second time, where he secured the favor of Clement VII. C., by his own account, was as great in arms as in art; he declares that it was himself who killed the constable Bourbon and the prince of Orange at the siege of Rome. His reckless conduct for some years compelled his constant shifting between Rome and Florence, Mantua, and Naples. In 1537, he went to the court of France, where he was very honorably received. Illness, however, induced him to return yet once more to Rome, where he had the misfortune to be imprisoned on a charge of plundering the treasures in the

castle of St. Angelo during the siege of Rome. At length he was liberated, through the intercession of the cardinal of Ferrara, for whom he executed, out of gratitude, a fine cup, and various other works. He now accompanied his deliverer to France, and entered the service of Francis I.; but having incurred the displeasure of the ruling favorite, Mme. d'Estampes, he returned to Florence—not, however, until, as usual, he had settled some matters with his "sword"—where, under the patronage of Cosmo de' Medici, he executed several fine works in metal and marble—among them, the celebrated bronze group of "Perseus with the Head of Medusa," now in the market-place in Florence. Among other preserved works of C., the splendid shield in Windsor castle may be noticed. In his 58th year he began to write his autobiography, and died in 1570 or 1572. In 1876, a number of C.'s original papers were found.

CELLS, in Physiology.—I. Animal Cells.—On examining, under a high magnifying power, any of the constituents of the animal body, we perceive that the smallest parts which appear to the naked eye as fibers, tubes, etc., are not ultimate elements in respect to form (morphotic elements), but that they contain and are built up of certain extremely minute particles, which differ in different organs, but always have a similar appearance in the same organs. By far the most important of these microscopic forms, which are known by histologists as "simple elementary parts," are the C., which not only form the starting-point of every animal and vegetable organism (the ovum in either kingdom of nature being simply a cell), but also—either as C., or after having undergone certain modifications which will be presently described—make up the tissues and organs of the perfect animal. Indeed, some of the lowest plants (red snow, gory dew), and of the simplest forms of animal life (Gregorinæ, etc., q.v.), appear to consist of a single cell.

While in plants the elementary parts generally unite directly with one another, in animals they are usually combined by an interstitial substance, which may be either solid or fluid, and is always derived from the blood or general nutrient fluid. If this interstitial substance take a part in the formation of the C., it is called a cytoblastema or a blastema, from *kutos*, a cell or vesicle, and *blastema*, germ substance; if it has nothing to do with their maintenance, it is called the matrix. The cytoblastema is usually fluid, as in the blood, chyle, etc.; while the matrix is solid, as in cartilage, bone, etc.

In every cell, we can distinguish, if we use sufficiently high magnifying powers, a membranous envelope, known as the cell-wall or membrane, and certain contents. The latter are fluid or gelatinous, and besides containing particles or granules, usually exhibit a peculiar rounded body, the nucleus; which, again, contains in its interior a fluid and a still smaller corpuscle, the nucleolus.

The fundamental form of the cell is spherical or lenticular; it is such in all young C., and is persistent in those which occur in fluids, as, for example, the blood-corpuscles. Amongst other well-known forms may be mentioned: the polygonal, as in pavement epithelium, or the pigment of the eye; the conical or pyramidal, as in ciliated epithelium; the cylindrical, as in cylinder epithelium; the fusiform, or spindle-shaped, as in contractile fiber-cells; the squamous, as epidermic scales; and the caudate, polar, or stellate, as the C. in the gray nervous tissue.

With regard to size, the largest animal C.—excepting the unicellular organisms—are the yolk-cells of the ova of birds and amphibia, while the blood-cells of certain animals may be taken as representing the smallest cells. Average C. range from 0.005 to 0.01 of a line in diameter.

The cell-membrane is usually transparent and colorless, mostly smooth, and so thin as to exhibit only a single contour, rarely of any measurable thickness. No traces of structure can be detected in it. The granular appearance which the membrane occasionally presents, is due to projections depending on granules lying on the inside; and it vanishes on the addition of water, which causes the cell to be distended by endosmosis. See Osmotic Action.

C. which contain only fluid are rare (fat-cell, blood-cell); generally, besides fluid, they contain elementary granules and vesicles, and sometimes crystals. As a general rule, the number of these morphotic elements increases with the age of the cell; sometimes, however, this is not apparent, in consequence of their being grouped in a single mass around the nucleus.

The nucleus is usually spherical or lenticular, transparent and either colorless or yellowish, and ranges from 0.002 to 0.004 of a line in diameter. All nuclei are vesicles, as was originally maintained, in 1841, by Schwann (*Microscopical Researches into the Accordance in the Structure and Growth of Animals and Plants*, Sydenham society's translation, 1847, p. 173), who must be regarded as the founder of the cell-theory in its relation to animal tissues, and as has since been confirmed by Kölliker and other later observers. The contents of the nucleus usually consist, with the exception of the nucleolus, of a limpid or slightly yellowish fluid, from which water and acetic acid precipitate granular matter. In general, only one nucleus exists in each cell, except when it is multiplying (a process which we shall presently explain); occasionally, however, we meet with several nuclei—four, ten, or even twenty.

The nucleolus is round, sharply defined, and often so small as to be almost immeasurable. Nucleoli are found in most nuclei so long as the latter are still young, and in many during their whole existence. As, however, nuclei exist in which no nucleolus

can be detected, we cannot regard the nucleolus as so essential an element of the cell as the nucleus. Most commonly a nucleus contains only one nucleolus; two are not unfrequently seen; more are rare.

Our knowledge of the chemical composition of C. is very imperfect. That the cell-membrane is a protein substance (q.v.)—at all events in young C.—is obvious from its solubility in acetic acid and in dilute caustic alkalies; and the membrane of the necleus seems to have a similar composition; while there are chemical reasons for believing that the nucleolus is composed of fat. In the contents of most C. we usually find such substances as occur in solution in the cytoblastema—viz., water, albumen, fat, extractive matters, and salts; and in the C. of secreting organs, as for instance, the liver and kidneys, we find the special secretions of those glands; in the blood-cells, we find hematocrystalline, etc.

There are two perfectly distinct ways in which C. can be generated: they may be developed independently of other C. in a plastic fluid (the cytoblastema); or they may be developed from pre-existing C. by cell-multiplication, the existing C. either producing secondary C. within themselves, or multiplying by division. In both these latter kinds of cell-development, the nucleus seems to be the center of development of the young cells.

In order that free or independent cell-development shall take place, we must have a cytoblastema containing protein substances (probably fibrin), fat, and certain salts (especially phosphates) in solution; and very possibly the presence of the particles of pre-existing C. may also be necessary, in which case free cell-development ceases to exist. The chyle and lymph corpuscles may be mentioned as examples of this mode of cell-formation. The steps of the process are not very clearly made out, but we know that the nuclei are first formed, and that the cell-membranes are developed around them. Free cell-development is far less common in man and the higher animals than cell-multiplication, and, we believe, never occurs in the vegetable kingdom. All pathological cell-formations—the C. in pus (q.v.), and in other morbid exudations—come, however, under this head.

The development of C. within other C. is of very common occurrence. An original or parent cell produces two or more secondary or daughter C., and the process of formation is said to be endogenous. Cartilage-cells afford a good example of this process. The nucleus and the contents of each parent cell undergo division into two parts, so that the number of C. is successively doubled. The mode in which the multiplication of the nucleus takes place cannot be definitely made out in all cases, but when clear observation is possible, the nucleoli first divide into two, and then separate.

A multiplication of C. by division has been proved to take place in the red blood-cells of the embryos of birds and mammals, and in the first colorless blood-cell of the tadpole, and very probably occurs extensively in many embryonic and adult tissues, in which a self-multiplication of C. is certain, but where no parent C. with secondary C. can be detected. In this and similar cases we have an elongation of the cell, and the single nucleus becomes divided into two; the cell then suffers constriction in the middle, which proceeds till it finally separates into two parts, each of which contains a nucleus. This variety of cell-formation affords a good illustration of the doubt and difficulty connected with this class of investigations. It was altogether unknown to Schwann when he published his great work in 1839, and was first noticed and described by Remak in 1841, who, however, subsequently retracted his published view, and did not again advocate it till Kölliker confirmed his observation, and declared it to be correct.

No satisfactory theory has been propounded with the view of explaining the development of cells. Schwann compares the formation of C. with that of crystals, but it must be recollected that the molecular attraction concerned in the formation of C. is so far peculiar, that—1. It never produces geometrical solids, but even in the nucleus and nucleolus determines a globular form; 2. That it aggregates not homogeneous, but chemically different substances; and 3. That the final result of its action—namely, the cell—is extremely limited in size, while a crystal may be of a comparatively indefinite magnitude.

The growth of C. requires some notice. Growth probably occurs in all C., although not in all to the same extent. It is most obvious in those which are formed directly round a nucleus, since in these the membranes which at first closely invest the nucleus, in time become distended and enlarged, and merely remain in contact with the nucleus at one point. Growth may take place either in surface or in thickness. The former is most commonly general—viz., in all those cases where C. increase without altering their form; but is sometimes partial—viz., in those cases in which the cell deviates considerably from the primary globular form. The latter occurs to a certain degree in all C., but in some kinds to a far greater extent than in others. The nuclei and nucleoli also take part to a certain extent in the growth of the cells. Schwann gives the following general explanation of the process of growth. He considers that the molecules of the cell-membrane exert an attractive influence on the fluid which surrounds them, and deposit its newly formed particles amongst themselves. If the deposition take place between the molecules already present in the substance of the membrane, the cell

becomes distended; if it take place only in one or more definite directions, the membrane becomes thickened.

Having now traced the cell to the period of its full growth, we are prepared to consider the processes which occur in the anterior of this minute organic structure, or, in other words, the physiology of cells. To enter satisfactorily into this subject, we ought to have an exact knowledge of the chemical composition of the contents of different cells. All that we know of the contents of C. generally is, as we have already stated, that they usually consist of a moderately concentrated solution of protein matters, with alkaline and earthly salts, and dissolved or suspended fat-particles; and that besides these ingredients many C. contain either a great preponderance of one of these constituents, to the almost entire exclusion of others, or are found to contain altogether new substances. Thus, there are C. with much protein matters, as the nerve-cells, and with much fat, like the fat-cells; while there are other cells which specially contain hæmatine (the red coloring matter of the blood), pigment, biliary and urinary constituents, mucus, milk, sugar, etc.

The main cell-processes occurring in these variously constituted C. are absorption, secretion, and excretion. These depend principally, if not entirely, upon chemical and physical laws, and are to a great extent amenable to micro-chemical observation.

Absorption, or the appropriation of matters from without, is most manifest to those C. which at first have little or no contents save the nucleus. Although endosmose must be taken into account as a condition of absorption, C. must not be regarded merely as vesicles provided with indifferent porous membranes; for the filling of C. does not take place by their admitting every kind of matter indiscriminately; but they have the power of taking up one constituent, and rejecting another, and thus exhibit a selective faculty.

The cell having thus become filled from without, we have next to inquire into the changes which take place in the membrane and in the contents. As regards the former, the membranes of most C. not only become denser and more solid with age, but they undergo changes in their chemical constitution. Thus, in the horny tissues, the young C. are easily soluble in alkalies and acids, while older C. of the same nature are scarcely affected by these re-agents; again, in cartilage C., the membrane not only becomes firmer with age, and thickens as ossification proceeds, but is changed into a tissue yielding gelatine or glue on boiling, which subsequently becomes impregnated with salts of lime (phosphate and carbonate). See Bone.

The function of secretion is mainly carried on by changes in the contents of the C. Thus, mucous is formed in the epithelial C. of the mucous membranes, pepsin in those of the gastric glands, bile in the C. of the liver, and sepia in the C. of the ink-bag of the cuttle-fish. In these cases, the C. do not separate mucus, pepsin, etc., from the blood, but merely the materials from which they elaborate these substances. In other cases, as, for instance, in the C. of the kidney, the function of these minute organisms is not to manufacture new products, but merely to separate certain substances (urea, uric acid, etc.) from the blood, which, if not immediately removed from the general circulation, would speedily accumulate, and act as a deadly poison. That these C. merely separate the urea from the blood, and do not form it in their interior, is proved by the fact that, if the kidneys of an animal are extirpated, the urea and other urinary constituents may speedily be found in large quantity in the blood.

Excretion takes place by the bursting or solution of the distended secreting cell, usually into the duct of a secreting gland. The reader who desires further information on the functions of the C. in relation to secretion and excretion, is especially referred to an admirable memoir by prof. Goodsir, "On Secreting Structures," published in John and Harry D. S. Goodsir's *Anatomical and Pathological Researches*, 1845.

In conclusion, we must notice the metamorphoses of C. The ovum itself is, as we have already mentioned, merely a nucleated cell; after impregnation, a number of secondary C. are formed within it, by a process of cleavage or segmentation. See articles Generation and Ovum. Some of the C. which occur in the ovum in its early stages soon coalesce with others to form the higher elementary parts, which we shall shortly enumerate; others, without entering into combinations, more or less change their previous nature, as the horny plates of the epidermis and nails; while others, again, undergo no change of form throughout the period of their existence.

The permanent C. are arranged by Kölliker (*Manual of Human Histology*, translated by Busk and Huxley, 1853, vol. i. p. 47) under the following heads:

1. *True Cells*, which have in no essential respect altered their cellular character. These occur in the epidermis and the epithelium; in the blood, chyle, and lymph; in the glandular secretions, in the fatty tissue, in the gray nervous substance, in the glands (liver, spleen, etc.), and the cartilages. Their varieties of form and contents have been already noticed. Regarding their modes of occurrence, some are either isolated in fluids or in solid tissues; others are united by apposition, without any intervening structure, into a cellular parenchyma; while others, again, are conjoined by an intercellular substance of some kind.

2. *Metamorphosed Cells.* To these belong—*the horny scales:* flattened, polygonal, or fusiform; their membrane being fused into one mass with their contents. They occur in the epidermis, the laminated pavement epithelium, and the hair and nails. *The con-*

tractile fiber C.: fusiform, slightly flattened, considerably elongated C., whose membrane, with its soft, solid contents, is changed into a contractile substance. They occur in the smooth or involuntary muscles. *The tubules of the crystalline lens of the eye:* very elongated C., with viscid, albuminous contents. *The prisms of the enamel of the teeth:* greatly elongated, prismatic, and strongly calcified cells. *The bone C.:* thickened C. (with *canaliculi*, or minute branching canals) which have coalesced with the matrix of the bones. *The transversely striated muscular C.:* large polygonal C. whose contents have become metamorphosed into a transversely striated or striped tissue, such as is found in voluntary muscular fiber. From these C. are formed all the different fibers, net-works, membranes, tubes, etc.; in short, all the higher elementary parts of which the animal body is composed.

For further information on C. and cell-development, the reader is referred, in addition to the works quoted in this article, to Leydig, *Lehrbuch der Histologie des Menschen und der Thiere*, 1857; and to Frey, *Histologie und Histocheme des Menschen*, 1859 (translated by Barker, 1874). He will find full details on morbid cell-development (the growth of C. in tubercle, cancer, and other morbid deposits) in Vogel's *Pathological Anatomy of the Human Body*, translated by Day, 1847; and in Wedl's *Pathological Histology*, translated (for the Sydenham society) by Busk, 1855.

II. Vegetable Cells.—In the vegetable, as in the animal kingdom, the primary form of the cell is that of a sphere. There are, however, interfering influences, which usually alter or modify the primary form, of which the most important are, (1.) Special directions assumed in the development, in obedience to a law regulating the structure of the tissue in which the cell occurs; and (2.) Obstructions to the expansion of the cell in certain directions from the pressure of surrounding cells.

The most common forms referrable to the law of development are, (1.) The *spherical* or fundamental form; (2.) The *cylindrical*, in which there is a tendency to elongation in the direction of a vertical axis; and (3.) The *tubular*, in which there is an excess of development in the direction of the two transverse axes.

The secondary modifications of these forms are numerous. Thus, in lax tissues, the spherical form may become an irregular spheroid, running out into *lobed*, and even *stellate* forms, as may be seen in the pith of rushes and the stems of various aquatic plants. Again, in seeds, the hard part of fruits, etc., the mutual pressure of the C. converts the spherical into *polyhedral* forms, of which the *dodecahedron*—giving a hexagonal section, and arising from equal pressure in all directions—is the most common, although *cubic* and many other forms occasionally occur.

The magnitude of the vegetable C. is very varied. In flax, the liber-cells have been found $\frac{1}{4}$, or even $\frac{3}{4}$ of an inch in length, and the cylindrical C. of some of the confervæ are more than an inch long—although their transverse diameter is very minute—whilst, on the other hand, the spores of fungi are C. of a diameter of $\frac{1}{5000}$ of an inch. The average diameter of the C. in the parenchymatous tissues is about $\frac{1}{400}$ of an inch.

Both the cell-wall and the contents differ from the corresponding parts in animal cells. In all young C. the wall is membranous, freely permeable by water, elastic, and flexible. In many cases it retains these properties, whilst in others it becomes much modified, as the cell grows older. It consists mainly of cellulose (q.v.). As the vital and chemical phenomena exhibited by plants depend primarily upon operations in the interior of the cell, the careful study of the cell contents is of the highest importance. Of these contents, the most important are the *primordial utricle*, with the *protoplasm*, the *nucleus*, *chlorophyll corpuscles*, and *starch granules*.

The primordial utricle is a layer of substance of mucilaginous consistence (colored yellow by iodine), lining the entire wall of the young cell, but often disappearing at a comparatively early period. The protoplasm is a tough mucilaginous and frequently granular fluid, which fills up the space in the interior of the cell not occupied by the nucleus. The nucleus or cytoblast is a globular or lenticular body, identical in its character with the substance of the primordial utricle, and occurring in the protoplasm of most young cells. Little is known with certainty regarding the chlorophyll corpuscles, except that, under the influence of solar light, green coloring matter is developed from them. Of the starch granules, which are very commonly found in the cell contents, we need not speak, as they are sufficiently described in the article Starch.

In addition to the above organized structures, we must mention as frequent constituents of the cell-contents, fluid coloring matters, essential and fixed oils, resins, sugar, dextrine, gum, alkaloids, and mineral or organic salts, which are not unfrequently found in a crystalline form, when they are termed raphides.

There are two modes of cell-development in the vegetable kingdom—viz., (1) *Cell-division*, where two or more new cells fill the cavity of the parent cell, and adhere to its membranes, appearing to divide it into compartments; and (2) *Free cell-formation*—not to be confounded with a process of the same name which is supposed to occur in the animal kingdom—in which the whole or part of the cell-contents become detached from the cell-wall and resolved into new loose C., which ultimately escape from the parent cell. The former mode universally occurs in the formation of the C. by which growth is effected; the latter occurs only in the production of C. connected with reproduction. For further information, we must refer the reader to Von Mohl's *Principles of the Anatomy and Physiology of the Vegetable Cell*, translated by Henfrey, London, 1852.

CELLULA'RES, in botany, a designation applied to those plants which consist entirely of *cellular tissue* (q.v.), without proper vessels of any kind. C., thus defined, are a subclass of acotyledonous plants, containing the orders of *lichens*, *fungi*, and *algæ*. In the system of De Candolle, however, the name C. was given to the second grand division of plants, the first being called *vasculares*, and the distinction between them being the presence or absence of vessels, the C. including all acotyledonous or cryptogamous plants. But ferns and mosses are not destitute of vessels; so that this system is not strictly accurate with regard to them: whilst, as all vessels are now known to be formed by the elongation and union of cells, the distinction between vascular and cellular tissue is not generally regarded as affording a good basis for primary divisions in the classification of plants.

CEL'LULAR TIS'SUE. This is the old term for a widely diffused animal texture, which has also received the names of areolar, reticular, filamentous, and connective tissue. If we make a cut through the skin, and proceed to raise it, we see that it is loosely connected with the subjacent parts by a soft, filamentous, elastic substance, which, when free from fat, has a white fleecy aspect. This is the tissue in question. It is also found underneath the serous and mucous membranes which are spread over internal surfaces, and serves to attach these membranes to the parts which they line. We likewise find it lying between the muscles, the blood-vessels, nerves, etc., occupying the interspaces between the different organs, and often investing each of them with a special sheath. While it thus connects and insulates entire organs, it at the same time performs a similar function in regard to the minute parts of which each organ is made up. Thus, for instance, in muscular tissue, it enters between the fibers of the muscle, uniting them into bundles; and similarly, it enters into glands, etc. This is termed *penetrating* or *parenchymal* cellular tissue.

It is not only one of the most general and most entensively distributed of the tissues, but it is continuous through the whole organism, and may be traced without interruption from any one region of the body to any other. It is in consequence of this continuity that dropsical fluids, air, etc., effused into the C. T., may spread far from the spot where they were first introduced.

On examining a fragment of this tissue, when stretched out, we see with the naked eye that it presents the appearance of a multitude of fine, soft, colorless, elastic threads, like spun glass; intermixed with these are delicate films or laminæ, crossing one another in all directions, and leaving open spaces, or areolæ; hence the name of areolar tissue.

A small quantity of colorless transparent fluid is always present in this tissue; when abnormally increased, it gives rise to the form of general dropsy known as anasarca. The microscopic characters of C. T. are briefly noticed in the article TISSUES, ANIMAL.

CELLULAR TISSUE, in botany, is any vegetable tissue formed of cohering cells alone, and in which there are no vessels. It is often called *parenchyma* (Gr. something spread out), although an attempt has been made to restrict that term to one kind of it, with cells of a particular form, and terms of Greek derivation have been multiplied for other kinds. The cells of C. T. vary much, both in form and size (see CELLS); but particular forms and sizes are characteristic of particular kinds or particular parts of plants. The products of the vital activity of plants are formed in the interior of cells, or by secretion from the inner side of their walls. Vessels being formed from cells, it is not easy to fix the limits between C. T. and *vascular tissue* (q.v.). Some kinds of plants, however, are entirely composed of C. T. (see next article); all consist of it in the earliest stages of their growth; none are at any time destitute of it. Fluids are transmitted from cell to cell, through the mass of C. T., passing through the walls of the cells where there are no openings that can be detected by the microscope. The soft and succulent parts of plants, which it is the care of the gardener to cherish and increase, consist chiefly of cellular tissue.

CEL'LULOID, a remarkable modern invention, apparently capable of wide usefulness, wherever India-rubber and various kinds of cloth are now employed. Celluloid is produced by mixing gum camphor with a pulp of gun-cotton, and subjecting the combination to a high degree of pressure and heat. The result is a hard product of extraordinary toughness and elasticity. It can be made plastic again and molded into any required form. Any color can be given to it by the use of coloring matter during the process of manufacture. It is extensively used as a substitute for ivory, which it resembles so closely that it is sometimes difficult to detect the difference. It is said to equal ivory in strength and elasticity, and not to warp or discolor with time. It has proved a good material for piano and organ keys, billiard-balls, backs of brushes, looking-glass frames, handles for knives, forks, umbrellas, and many other articles. It is much cheaper than ivory, and is claimed to be better for decorative purposes. It is also used with much success to imitate tortoise-shell, malachite, amber, pink coral, and other costly materials. In imitation of tortoise-shell, it is made into combs, napkin-rings, match-boxes, card-cases, etc. Imitations of pink coral jewelry are made and sold at prices much below those of the genuine. The same is true of imitations of malachite and amber. Mouth-pieces for pipes, cigar-holders, etc., are common. It is also used as a substitute for porcelain in making dolls' heads. The frames of eye-glasses, opera-glasses, and spectacles are made of it. More recently it has come into use in

combination with linen, cotton, or paper, for shirt bosoms, cuffs, and collars. The material has a hard glistening surface, like that of newly laundered linen; is elastic and impervious to moisture, and when soiled can be renovated with a moistened sponge. There seems to be some danger in the manufacture of C. Though there have been explosions and several persons killed in one of the manufactories, it is said that with due care, and avoidance of unwarrantable experiments, the manufacture is not unsafe.

CELLULOSE′ is the term applied to the carbohydrate, $C_{12}H_{10}O_{10}$, which forms the mass of the cell-membranes of all plants. It is one of a class of compounds intimately connected in their chemical constitution, but presenting remarkable physical differences. Without entering into chemical details, we may mention the following points of difference between it and the chemically allied substances—sugar, dextrine, and starch. Sugar and dextrine are soluble in cold water, and occur in the cell sap in solution; starch is insoluble in cold water, but softens into a mucilage in boiling-water, and is found in granules in the cell-contents; while C. is insoluble in cold or boiling water, and, as far as is at present known, is very slightly soluble in the strong mineral acids, its only perfect solvent being a solution of oxide of copper in ammonia.

The occurrence of C. in an organism was formerly regarded as a certain proof that the latter belonged to the vegetable kingdom. It has, however, been shown to be a constituent of the lower animals.

Although C. forms a large proportion of the food of herbivorous animals, it is supposed to pass through the intestinal canal unchanged, and not to contribute directly to nutrition.

CELSIUS, Anders, 1701–44; a Swedish astronomer, b. at Upsala. He traveled in Germany, France, Italy, and took part in the expedition of 1736 led by Maupertius and others to measure a degree of latitude in Lapland. C. was a member of the academies at Stockholm and Berlin, of the British royal society, and secretary of the royal society of Upsala. Among his works are *Observations on the Measurement of the Earth*, and *A New Method of Measuring the Distance of the Sun from the Earth*, in which he endeavored to show that the waters of the ocean are decreasing in volume.

CELSUS, an Epicurean philosopher, but tinged with Platonism, lived in the 2d c. after Christ, and wrote, after 150 A.D., under the title *Logos Alethes* (the True Word) the first considerable polemic against Christianity. The book itself has perished; but considerable fragments have been preserved as quotations given by Origen in his answer, *Contra Celsum*, in eight books. In the fragments—which are very interesting, as showing the views of a heathen philosopher in regard to Christianity—C., with wit and acuteness, but without depth or earnestness of thought, prefers against the new religion charges of unphilosophicalness and blind credulity; and especially endeavors to convict Christians of self-contradiction in their spiritual doctrine contrasted with their anthropomorphic representations of Deity; in their religious arrogance contrasted with their confession of sinfulness; and in their views of the necessity of redemption. He also reproaches Christians with their party divisions and ever-varying opinion. With regard to his own positive doctrines, he speaks of evil as necessary and eternal, as an essential property of the material world (*hyle*); sin as something that can never be entirely removed, and least of all through a vicarious sacrifice. He charges Christians with having willfully altered their sacred writings.

CELSUS, Aulus Cornelius, a Latin physician and writer, who flourished probably in the reign of Augustus. He was called the Roman Hippocrates, because he generally followed the great "father of medicine," and introduced the Hippocratic system among the Romans. C. wrote not only on medicine, but also on rhetoric, history, philosophy, the art of war, and agriculture. His style is succinct and clear, but full of Græcisms. The only great work of his which survives, is the *De Medicinâ*, which is divided into eight books. The portions relating to surgery are exceedingly interesting and valuable, because C. has there given an account of the opinions and observations of the Alexandrian school of medicine. The first edition of the *De Medicinâ* appeared at Florence in 1478. C.'s works have been translated into several modern languages. A translation into English was made by Dr. Grieve, London, 1756. Among the best editions are those of Krause (Leip. 1766), Dr. Milligan's 2d edition (Edin. 1831), and one at Cologne, 1835.

CELT (Lat. *celtis*, a chisel), the name by which certain weapons or implements of the early inhabitants of western Europe are known among archæologists. Celts are either of *stone* or of *bronze*.

Stone celts vary in length from about 1 in. to 22 in.; but the most common size is from 6 to 8 in. in length, and from 2 to 3½ in. in breadth. They are made of almost every kind of stone, and show considerable diversity of shape, almost all, however, having more or less resemblance to the muscle-shell. The ruder celts are generally of slate, shale, schist, or grit; the finer, of flint, porphyry, greenstone, syenite, or agate. Many of the finer celts are beautifully shaped and highly polished. A remarkable example of this class, the property of sir Coutts Lindsay, found near St. Andrews, in Scotland, is described by sir David Brewster in the *Philosophical Journal* for 1823. Recently, a class of celts found in the later geological strata have excited

much interest as well among archæologists as among geologists. They are obviously of the same type with the more common celts, but of ruder construction, as if fashioned by a more barbarous people. The stone C. was fastened into a handle of horn, bone, or wood. A C. of serpentine, with a handle of deerhorn, was found in one of the Swiss lakes in July, 1859, and a stone C. with a wooden handle, in the county of Tyrone, in Ireland.

Bronze celts vary in length from about 1 in. to 8 or 10 in., the most common length being about 6 inches. They are sometimes ornamented with rudely incised lines or circles, and have occasionally been found wrapped up in linen, or inclosed in bronze cases or sheaths. They show much greater diversity of shape than the stone celt. As many as four classes have been distinguished by archæologists—1st, The simple wedge-shaped C., most nearly resembling the common form of the stone celt. 2d, The wedge-shaped C., with sides more or less overlapping, and a stop ridge or elevation between the blade and the part which received the handle. 3d, The wedge-shaped C., with sides greatly overlapping, with or without the stop-ridge, but with a loop or ear upon, and parallel to, its lower surface. 4th, The socketed C., or the C. with a hollow to receive the handle, and generally with a loop or ear upon its lower surface.

Both stone and bronze celts were probably used for several purposes, serving for chisels, adzes, and axes, as well as for weapons of war, like the stone hatchets of the South Sea islanders and other savage or barbarous tribes. Examples of stone and bronze celts of all classes (together with the molds in which bronze celts were cast) may be seen in the British museum at London, in the national museum of the antiquaries of Scotland at Edinburgh, and in the museum of the Royal Irish academy at Dublin. The last collection has more than 500 examples of stone celts, about one half of which were found in deepening the bed of the Shannon or its tributaries, between the years 1843 and 1848. A bushel of bronze celts has more than once been discovered at one spot.

CELTIBE'RI, a powerful people of ancient Spain, supposed to have sprung from a blending of the Iberians or Spanish aborigines with Celtic invaders from Gaul. The C. inhabited a large inland district of the peninsula, corresponding to the s.w. half of Aragon, nearly the whole of Cuença and Soria, and a great part of Burgos, but the name Celtiberia had often a wider signification, including the country as far s. as the sources of the Guadalquivir. The C. were divided into four tribes, and were unquestionably one of the bravest and noblest peoples in the peninsula. Their cavalry and infantry were equally excellent. For many years, they withstood the efforts of the Romans to subdue them, and it was not till after the campaigns of Sertorius that they began to adopt the Roman language, dress, and manners.

CELTIC NATIONS, one of the groups of the great Aryan (q.v.) family.

Languages.—In addition to the English, and retreating before it, there are at present four languages spoken in the British isles—the Irish, the Highland Scotch (or Gaelic), the Manx, in the isle of Man—all three nearly related to one another, and constituting the northern (Erse, Gadhelic) branch of the Celtic languages; whilst the fourth language, the Welsh, constitutes, together with the Cornish of Cornwall (extinct since 1778) and the Bas Breton of Brittany, the southern (Briton, Cymric, Cambric) branch. The remains of the language of the Gauls or Celts, the ancient inhabitants of France, closely resemble the British and Gadhelic idioms; hence the name Celtic languages has been applied to the whole of them. The Celtic idioms belong to the Indo-German (Aryan) family, as their numerals show. Compare

	Old Irish.	Old Welsh.	Sanscrit.
1.	óin	un	êka
2.	dá	dou	dvâu
3.	trí	tri	trayas
4.	cethir (c=k)	pedwar	chatvâras
5.	cóic	pimp	panchan
6.	se	chwech	shash
7.	secht(n)	seith	saptan
8.	oct(n)	wyth	ashtan
9.	noi(n)	nau	navan
10.	deich	dec	daçan
20.	fichet	ugeint	vinçati
100.	cét	cant	çata

The Gaulish was nearer to the Cymric branch, its numerals 4 and 5 having been *petor, pempe.* There are a few Gaulish inscriptions which show a declension with full inflections; in old Irish, five cases still exist, but the terminations are very much mutilated; in Welsh, they have disappeared. Thus, the Gaulish name *Segomaros* is declined: gen. *-ri*, dat. *-ru*, acc. *-ron;* the old Irish, *fer*, a man, has the gen. *fir*, dat. *fiur*, acc. *fer*, voc. *fir;* whilst the correspondent Welsh *gwr* is inflexible. Hence it follows that the pseudo-simplicity of the Welsh is the result of grammatical decay, common in all Aryan languages, and does not at all warrant Latham's theory, that the Celts branched off from the primitive Indo-German nation before the development of case inflections.

History.—Of the separation of the Celts from the other Aryans or Indo-Germans, and

their early migrations to western Europe, no record has come down, the stories about Milesian colonies in Ireland, and migrations from Troy into Wales, being simply monkish fictions. At the dawn of history, we find the *Gauls* (Galli, Celtæ, *Galatai*) occupying France (Gallia), which was divided into *Aquitania*, between the Pyrenees and Garonne; *Gallia Celtica* proper, between Garonne and Seine; and *Belgica*, from the Seine to the Rhine. The land about the *Rhone* being more early conquered by the Romans than the rest, was set apart by them under the name of *Gallia Narbonensis*, or *Gallia Lugdunensis* (from the towns Narbo and Lugdunum, Narbonne and Lyon). The whole of the four was called Gaul beyond the Alps (*Gallia Transalpina*). A great many tribes of Gauls had settled in Lombardy, where they founded *Mediolanum* (Milan), and which therefore took the name *Gallia Cisalpina* (Gaul this side the Alps). Other Gauls had penetrated into Spain, where they became mixed with the native Iberians, and thus gave rise to the *Celtiberians* about the river Iberus (Ebro). Numerous hosts migrated across the Rhine, occupied southern Germany and Bohemia, and, following the course of the Danube, some invaded Thrace and Greece (278 B C.); but being repelled, the main body of them settled in Asia Minor, in the province called after them *Galatia*. The Romans found the Gauls at first very formidable enemies; Rome itself was burned by them (389 B.C.), but gradually the Romans conquered first Gallia Cisalpina (222), then Gallia Narbonensis (112), and lastly, Cæsar subjected all France (52 B.C.), after which the Gauls soon became Romanized. The Gauls of Asia Minor, for a long time the terror of all the neighborhood, were defeated by the Romans (187), and their land finally made a province of the empire (25 B.C.).—The *Britons* (*Britanni;* Welsh, *Brython*) were little known before Cæsar's two unsuccessful expeditions into Britannia; the country was conquered by the Roman gen. Agricola (78–84 A.D.), who secured the new province against the inroads of the Caledonians of Scotland by a fortification across the Scotch lowlands, between the Forth and the Clyde, afterwards removed by the emperor Hadrian further southward, to between Solway firth and the mouth of the Tyne. The Britons were so much influenced by Roman civilization—they were also early converted to Christianity—that the heathen Angles and Saxons, who conquered them in the 5th and 6th centuries, called them *Welsh;* a name which, with the other Teutons, applies to all nations speaking languages of Latin descent. A few of the Britons maintained their independence in Cornwall, Cumberland, and in the mountains of *Wales*. On the last, the name Welsh was ultimately fixed by the English; they themselves, however, called their nation *Cymro*, pl. *Cymry* (a compound of *cyn*, with, in common, and *bro*, land = having a common country, countrymen, in contradistinction to the foreign invader), a name which has nothing to do with Cimbri and Cimmerii. The Welsh remained independent under different petty princes till 1282, when Edward I. conquered them. A part of the Britons went over in the 4th c. to France, where they took possession of *Brittany*, which maintained a doubtful independence under dukes of its own till about 1500.—Whether the *Caledonians*, the oldest inhabitants of Scotland, were Celts of the Cymric or Erse branch, is unknown. After the 3d c., their name disappears, and we hear, instead, of the Scoti and Picti. As to the latter, the same doubt prevails; but the *Scoti* were emigrants from Ireland, both *Scotus* and *Gadhelus* being common national names of the old Irish. From *Gadhel*, the modern *Gael*, *Gaelic* is derived, which has nothing to do with the name of the Galli.—*Ireland* (*Hibernia*, whence the modern *Eirinn* is derived), enters into the light of history with its conversion to Christianity by St. Patrick (460). The four centuries following on this event are the brightest period in its history. Ireland was then the seat of piety and learning, and sent forth numerous missionaries, by whom many monasteries, centers of civilization, were founded—as *Iona*, in Scotland, by Columba (563); *St. Gall*, by Gallus (615); *Würzburg*, by Kilian (687). In the 7th c., we find Irish bishops at Ratisbon; and *Virgilius* (Feargal), (died 784), bishop of Salzburg, played no small part in the ecclesiastical history of Germany. But Ireland remained politically divided among many princes, and so became an easy prey of those "black heathens" the Scandinavians, whose invasions began 795, and who founded Norse kingdoms at Dublin, Waterford, Limerick, etc. In the fierce battles between the two nations, the prosperity of Ireland rapidly declined, and the English conquest (1171) only completed the ruin.—The isle of *Man*, inhabited by a branch of the Irish, after having been subject to Welsh, Scotch, Norse princes in turn, acknowledged England's sovereignty in 1344.

Religion and Mythology.—A few notices in the classics and the Latin inscriptions of Gaul are our rather meager sources of information on the Celtic paganism. As the three chief gods, or three of the chief gods, Lucan mentions *Teutates*, *Hesus*, and *Taranis*, all of them worshiped with human sacrifices. *Taranis* reappears as *Jupiter Taranucnus* on an inscription; and from this identification with Jupiter, as well as from the fact that in Welsh *taran* means thunder, we may infer that he was the god of the thunderstorm. Other gods frequently occurring on inscriptions are *Apollo Grannus*, *Apollo Belenus*, *Mars Camulus*, *Minerva Belisama*, etc., all of them, however, empty names to us. A remarkable feature in Gaulish religion was the worship of certain *Mother Goddesses* (called on the inscriptions Junones, Matronæ, Deæ Matres, Campestres, Nymphæ). They are frequently connected with special localities, as in the inscriptions dedicated to Matronis Lanehiabus, M. Hamavehis, M. Rumanehabus, and on the one in Gaulish: *Matrebo Namaucicabo*, "to the Mothers of Nîmes." To this class apparently belongs the *Dea*

Nehalennia, once represented on a relief with a basket of fruit, and a dog for companion. Mela, the geographer, speaks of an island in the Atlantic, near Gaul, where there was an oracle superintended by nine maidens, who could cause storms, take the form of any animal, could cure what otherwise was incurable, and predicted the future. These goddesses, at once motherly and maidenly, residing in field and wood (campestres, nymphæ), givers of plenty and prophets of the future, are the heathen prototypes of the *fées* (fairies, as distinguished from "elfs") of the middle ages. The "little folk" were known to the Gauls under the name of *Dusii*. They believed in the existence of individual tutelary genii, as a stone of Lausanne shows, being erected by three Gauls *Sulfis* SUIS (hence our sylph?). The belief in the transmigration of souls was common amongst the Gauls, or at least their priests the *Druids*, so called from their performing sacred rites in oak-woods (Welsh, *derw*, an oak; *derwydd*, a Druid). These Druids were also the depositaries of knowledge and tradition, and constituted, in Gaul at least, a powerful hierarchy, with a supreme pontiff. Druids are found both in Ireland and in Wales, and the fées abound in Welsh tradition; but it is very doubtful whether the superhuman beings appearing in the Welsh poems of the 12th and 13th centuries—such as *Hu Gadarn*, the reputed founder of Bardic institutions (see beneath)—are genuine relics of the British religion. The belief in transmigration lasted very long, as the mediæval Welsh tale of *Taliesin* speaks distinctly of Taliesin's successive existences. Though not properly mythological, we may mention here the romantic stories of the Britons about king *Arthur* and his knights. He is first mentioned by Nennius in the 9th c.; but his fable was further developed in the next centuries both in Wales and Brittany, then embodied in Geoffrey of Monmouth's *Historia Britonum*, which served as the groundwork of the French *Roman de Brut* of Wace. Through these works, and partly, also, through the direct influence of the oral traditions of Brittany, it passed into French literature, and thence spread over all Europe.

Literature.—The Gauls learned writing from the Greeks; later, they employed the Roman alphabet, as do the Welsh and Irish, the now used Irish character being nothing but the common Anglo-Saxon form of the Latin alphabet. Besides, however, the Irish claim an old character of their own, the Ogham, in which the letters are represented by a number of vertical strokes put in a right angle to a horizontal line, or else by horizontal strokes to a vertical line. Some of the Ogham inscriptions are said to be older than Christianity. Even more doubtful is the antiquity of a Welsh so-called Bardic alphabet, in which there seem to be no inscriptions extant, and which is, at any rate, an alteration of the Roman character. A feature common to all Celts is the existence of a kind of literary order, the *Bards* (q.v.), poets and guardians of tradition—in Gaul, nearly related to or part of the priesthood; in Wales and Ireland, in immediate connection with the kings.—A *Gaulish* literature there certainly was, as Cæsar informs us that, in the schools of the Druids, the young men used to learn by heart a great number of verses on theological and historical subjects. But these poems were never written down. It is highly probable that rhyme, first used by St. Ambrosius (397) in his hymns, is of Gaulish origin, this being the common form even of the oldest Irish and Welsh poems.—The *Irish* literature began with the conversion, but our existing manuscripts are not older than the 9th or 8th century. Interlinear versions of biblical and other theological, or of grammatical writings are about the oldest manuscripts, many of which, in consequence of the missionary zeal of the nation, are to be found at St. Gall, Milan, and other continental places. Then there are ecclesiastic *hymns*, one of the oldest ascribed to Patrick. A renowned author of poems, in the 10th c., was Eochad O'Flin. Secular poetry of ancient times there has come down to us none, but we have testimonies as old as the 12th c. of the existence of such, ascribed in a general way to the old pagan hero Oisin, son of MacCumhal. The existing specimens, mostly warlike—except some dialogues between Oisin and St. Patrick—are recent. Those Gaels that went over to Scotland, took, of course, similar traditions with them. With a partial knowledge of these, Macpherson composed (1765) the work which he declared (rather loosely) to be an English translation of the songs of the old Scotch poet Ossian, son of Fingal (the true Oisin was an Irishman). The would-be Gaelic original of Macpherson's work, edited in 1807, is either a compilation or retranslation. Of Irish prose, the annals are the most important part: first, those of Tighernach (1088), then the *Annales Inisfalienses, A. Ultonienses;* lastly, the *Annals of the Four Masters*, being a compilation made (1634) from older sources chiefly by four Franciscans, beginning with 242 after the deluge, and ending with 1616 A.D.—The oldest remains of *Welsh* literature are the songs, so far as they are genuine, of the bards of the 6th c.—*Liwarch Hen, Aneurin, Taliesin*—having chiefly the life and deeds of contemporary princes for their subject, but few in number. In the 10th c., we have the collection of laws by Howel Dda. The historians Gildas and Nennius, of the 9th c., wrote in Latin.

The great age of *Welsh* literature is the 12th and succeeding centuries, when the energies of the nation were roused in the struggle with England. In this contest, the bards played a conspicuous part as agitators. After a long interval, we hear again of a great bard, Meylyr (1100); many follow, amongst whom Kynddelw (1200) deserves special mention, both as a poet (we have 49 pieces of his) and a patriot. Welsh poetry consists in—1. Political lyrics, war-songs, songs in praise of chieftains, elegies on the same. 2. Religious hymns. 3. Pseudonymous poems, ascribed to Merddin (Merlin), the

mythical enchanter, and Taliesen, the old bard, having generally the form of prophesies on the struggle between the Saxons and Welsh, and the ultimate triumph of the latter. Thus, in the *Avalennau* (or apple trees), attributed to Merlin, the Welsh nation is enigmatically represented under the image of "seven score and seven sweet apple trees," whose fruits, princes (viz., the English) wish in vain to despoil. 4. The Triads, short memorial (?) verses in which *three* remarkable events, subjects, or persons are respectively mentioned (hence the name), embracing history, theology, jurisprudence. 5. Dialogues of dramatic character. There were—apparently now lost—also miracle plays actually represented.

The only remarkable remnant of *Cornish literature* comes under this head, being three ecclesiastical plays of the 14th c.—the *Creation*, the *Passion*, and the *Resurrection*.—In Welsh prose, we have first the chronicles. Geoffrey's chronicle, though Latin, is thoroughly national; then there is that of Caradoc, who begins where Geoffrey leaves off; and the *Liber Landavensis*, a history of the bishops of Llandaff down to 1132. Further, we have the *Mabinogion* (Children's Tales), romantic stories. The most interesting of these refer to Arthur and his champions; the lady of the fountain, Peredur, Geraint (now revived by Tennyson), Arthur's boar-hunt. Amongst the non-Arthurian tales, special mention is deserved by the *Mabinogi of Taliesin*, interspersed with verses, relating the adventures, transformations into animal shape, and transmigrations of that bard. There are besides some scientific writings, a treatise on medicine, another on geometry, and one on Welsh prosody by Edeyrn (1260). This last, a grammatical essay in and on a vernacular tongue, is paralleled in the middle ages only by Icelandic literature, to which, upon the whole, the Welsh, although not quite so high, bears a marked resemblance.

Concluding Remarks.—Altogether, the Celts are a very important branch of our Indo-German family. The incessant warfares of the Gauls bespeak at least activity of mind and body; the Irish missions have done a great deal for European civilization; whilst the traditions of the Britons have deeply influenced mediæval literature. The one great defect of the Celts is incapacity for political organization. Their very enthusiasm, lively feeling, and vivid imagination, have ever prevented them from taking coolly and deliberately those measures which lead to national unity; hence it is that they gave way before the more practical Roman and Teuton. But while they lost their independence, and oftentimes their very language, in the contest with the foreigner, whose strong hand molded them into national unity, yet they reacted on him in their turn. They are fast disappearing by merging into the English; but if the quiet resolution, the sturdy common sense, the talent for public life, state organization, and political dominion, that characterize the modern British nation, are altogether Teutonic—on the other hand, their genuine refinement of manner and feeling, and their high poetical susceptibilities, are to no small extent due to the admixture of Celtic blood.

CELTIS. See NETTLE-TREE.

CEMBRA NUT AND CEMBRA PINE. See PINE.

CEMENTA'TION OF STEEL is the process followed in the production of *blistered steel* (q.v.), or *steel of cementation*.

CEMENTS. A cement is a substance used to make the surfaces of solid bodies adhere to one another; it is applied in a liquid or viscous state, and hardens after the surfaces are brought together. When fused metals or alloys are used in this manner, they are called solders. There is a great variety of C. derived from animal, vegetable, and mineral substances. The animal C. are chiefly composed of gelatine and albumen as their bases. Joiners' glue is an example. See GLUE. The binding materials of vegetable C. are gums, resins, and wax. The mineral C. are chiefly of lime and its compounds. In many C., animal, vegetable, and mineral substances are combined. The simplest of the mineral C. is plaster of Paris, which is used for uniting slabs of marble, alabaster, and many similar purposes. It is mixed with water to the consistence of thick cream, and then applied. This hardens rapidly, but is not very strong. Its hardening depends upon the true chemical combination of the water with anhydrous sulphate of lime, of which plaster of Paris is composed, and the formation thereby of a solid hydrate. The plaster of Paris may be mixed with thin glue, with diluted white of egg, or a solution of size or gum, instead of water, and is strengthened thereby.

Keene's marble cement is prepared by steeping plaster of Paris in a concentrated solution of alum, then recalcining and powdering. This powder is mixed with water in the same manner as plaster of Paris. It is used as a stucco for internal decorations, takes a high polish, and when colored, forms beautiful imitations of mosaic, marbles, scagliola, etc.

A mixture of paper pulp, size, and plaster of Paris in equal proportions, forms a useful cement, and is also used as a sort of papier-mâché for casting into architectural ornaments, etc.

Common mortar is one of the most important of the lime cements. It is composed of slaked lime, or a mixture of this with sand; its hardening depends upon the slow formation of carbonate of lime by the absorption of carbonic acid from the atmosphere, and a partial combination with the silica of the sand. Cow-hair is sometimes mixed with it, to bind it when laid in masses. In order to obtain a fine smooth paste, which

is required for good mortar, the lime should be slaked rapidly by adding about three parts of water to one of lime; if the quantity of water is too small, a coarser or semi-crystalline hydrate of lime is produced by the slaking. For the mode of applying mortar, see BRICKWORK.

Ordinary mortar, when exposed to the continuous action of water, softens and disintegrates, and some of the lime dissolves away. Lime which contains 20 or 30 per cent of clay, or finely divided silica, produces a mortar which is not liable to this softening, but possesses the property of hardening under water; such lime is called *hydraulic*, and the mortar made from it, hydraulic cement or mortar.

Puzzolana, a porous lava found at Puzzuoli, near Naples, has been long celebrated for its property of forming a hydraulic cement, when mixed with ordinary lime. It is mainly composed of silicates of alumina, lime, and soda. Portland cement, so named from its resemblance to Portland stone when dry, is made from clay found in the valley of the Medway, which is intimately mixed with the neighboring chalk, and then burned. Roman cement is similar to the Portland, but of a darker color; it contains a larger proportion of clay, and solidifies more rapidly. These C. should be mixed with a sufficient quantity of water to form a moderately thick paste; the surfaces to which they are applied should be well wetted, and the cement kept slightly moist until it hardens. The solidification of hydraulic C. depends upon the combination of the lime with the silica and alumina forming, first a hydrated compound, and finally a true silicate. They expand slightly in solidifying.

The following receipts include some of the most useful and reliable C. applicable to the purposes specified: for water-tight joints, such as slate cisterns, aquaria, etc., and for uniting broken pieces of stone, and filling up metallic joints—take equal parts of red and white lead, and work them into a stiff paste with boiled linseed oil. When used for metal joints, it should be made rather thin, and both pieces of metal, as well as the washer, well smeared with it. This cement hardens slowly, but becomes ultimately of almost flinty hardness. We have before us an aquarium, holding fifteen gallons of water, made of plate-glass, cemented at the angles to mahogany columns with this composition. It has stood without leaking for above three years, in spite of much rough handling and moving about; and the cement is now so hard, that it is difficult to scratch it with a knife.

Cement composed of ox-blood thickened with finely powdered quicklime, is used by coppersmiths, for securing the edges of rivets of copper boilers, and for steam-joints. Another cement for steam-joints is made with borings or turnings of cast-iron mixed with a little sal ammoniac and flowers of sulphur. It should be stirred up with a small quantity of water, just sufficient to moisten it, then rammed into the joint, which should be bolted up as tightly as possible: 5 lbs. of iron borings to 2 oz. of sal ammoniac, and 1 oz. of sulphur, are the proportions recommended. A cement of this kind may be made of 4 lbs. iron borings, 2 lbs. pipe-clay, and 1 lb. of powdered earthenware fragments made into a paste with salt and water; or 2 parts litharge in fine powder, 1 part very fine sand, and 1 of quicklime that has slaked spontaneously in a damp place. These should be mixed, and kept from the air, and made into a paste with boiled linseed oil when about to be used. This is a valuable cement for steam joints, for mending cracks in boilers, ovens, etc. Beale's patent fireproof cement, for similar purposes, is composed of chalk, 12 parts; lime and salt, each 4 parts; Barnsey sand, 2 parts; iron filings or dust, 1 part; and blue or red clay, 1 part. These are ground and calcined together.

Electrical Cement—so called from its use in uniting the cylinders of electrical machines to their axes, and for a variety of similar purposes—is composed of 5 lbs. rosin, 1 lb. each of bees'-wax and red ochre, and 4 oz. of plaster of Paris. This is Singer's formula. A cheaper cement of this kind may be made from 14 parts rosin, 2 red ochre, and 1 plaster of Paris. These should be melted together till the frothing ceases, and the composition runs smoothly. This is applicable to a variety of purposes, where a cheap and tolerably adhesive cement is required. It will serve as bottle-wax for sealing the tops of corks; but this is usually prepared from 4 parts rosin with one of tallow or suet, and red ochre or other coloring matter added.

For mending earthenware and china, etc., a variety of C. are recommended. For ornamental glass or china, which is not subjected to heat or rough usage, Canada balsam that has evaporated until rather hard, is a very useful cement; from its transparency, it makes an almost invisible joint. The surfaces should be slightly warmed, and the balsam brushed over them, after which they should be kept pressed together for a short time. Thick copal or mastic varnish may be used in the same manner. Gum shellac, dissolved in spirits of wine in sufficient quantity to form a treacly liquid, forms a stronger cement than the above, but its color is objectionable for some puposes. The shellac may be dissolved in naphtha, but is not equal to that in spirits of wine. The *liquid glue* sold in the shops is usually prepared in this manner; another kind is made of a mixture of the solutions of shellac and India rubber. The cement sold in sticks at fairs and in the streets of London by loquacious itinerants, is shellac or gum mastic fused and molded into a convenient form, and is one of the most useful C. when properly applied, by heating the surfaces to be joined just sufficiently to fuse the shellac and then smearing them thinly with it, and pressing them together. If shellac is heated much above its fusing-point, it becomes carbonized and rotten, and therefore great care

must be used in fusing any composition of which it is an ingredient. The *marine glue*, a mixture of shellac and India rubber, is a remarkable cement, and when applied, as the last, with the precautions just alluded to, is so strong, that glass or china cemented with it, and then dashed on the ground, or otherwise broken again, will give way in any part rather than that cemented. This cement may be purchased ready made. For the mode of preparing it, see GLUE.

Universal Cement, used for the above and many other purposes, is prepared as follows: Curdle skim-milk with rennet or vinegar, press out the whey, and dry the curd at a very gentle heat, but as quickly as possible. When it has become quite dry, grind it in a coffee or pepper mill, and next triturate it in a mortar until reduced to a very fine powder. Mix this powder with $\frac{1}{10}$th of its weight of new dry quicklime, also in very fine powder, and to every ounce of the mixture add 5 or 6 grains of powdered camphor; triturate the whole well together, and keep it in small wide-mouthed phials well corked. When required, make it into a paste with a little water, and apply it immediately.

Cheese Cement is similar in composition and uses. Take two parts of grated cheese and one of quicklime in fine powder; beat these together with white of egg to form a paste, and use immediately.

The following is the reputed formula for preparing the *Armenian or diamond cement*, used by the Armenian jewelers for attaching diamonds, etc., without any metallic setting: "Dissolve 5 or 6 bits of gum-mastic, each the size of a large pea, in as much rectified spirit of wine as will suffice to render it liquid; and in another vessel dissolve as much isinglass, previously a little softened in water—though none of the water must be used—in French brandy, or good rum, as will make a 2-ounce phial of very strong glue, adding two very small bits of gum galbanum or ammoniacum, which must be rubbed or ground till they are dissolved. Then mix the whole with a sufficient heat. Keep the glue in a phial closely stopped, and when it is to be used, set the phial in boiling water." This cement has a great reputation, but our experience does not confirm it. We have tried the above, and several other receipts, with very little success. We doubt whether the true method of preparing it is known in this country, and suspect that it still remains one of the oriental trade-secrets. White of egg, thickened with finely powdered quicklime, forms a useful cement, especially if the cemented article is warmed for a short time in a slow oven.

Cutlers' Cement, used for fixing knives and forks in handles, is made of equal weights of rosin and brick-dust melted together; or, for a superior quality, 4 parts of rosin, 1 of bees-wax, and 1 of brick-dust.

Mahogany Cement, used for stopping cracks and holes in mahogany, may be prepared by melting 4 parts of bees-wax with 1 of Indian red, and as much yellow ocher as is found requisite to give the color. If shellac be substituted for the bees-wax, and less red used, a much harder cement is made.

For *French Cement, rice glue*, and other light C. for joining paper articles and artificial flowers, see GLUE and PASTE.

CEMETERY, from the Greek, may mean any grave-yard, or other place of deposit for the dead; but it has lately acquired a special meaning, applicable to those extensive ornamental burial-grounds which have recently come into use in this and other European countries, as the practice of burying within and around churches was gradually abandoned (see BURIAL). The fine burial-grounds of the Turks, extending over large tracts adorned by cedars and other trees, may have suggested the plan to Europeans. It was first exemplified on a great scale in Paris, in which, as the largest walled town in Europe, the disposal of the dead was long a matter of extreme anxiety and difficulty. There are few considerable towns in Britain near which there is not at least one C., and the legislation mentioned under the head of BURIAL has rendered their establishment, to a certain extent, a legal necessity. There was at first a natural feeling of regret at the prospect of deserting places of deposit for the dead so hallowed by ancient use and recent associations as the church and the churchyard. In many instances, however, the places thus professedly hallowed were in reality surrounded by degrading and disgusting circumstances. On the other hand, the new places of interment began to develop humanizing and elevating influences, in beautiful trees and flowers, natural scenery, and works of monumental art. The new cemeteries are in many instances cheerful open places of recreation, and in them the place of rest for the dead has rather tended to improve than to undermine the health of the living. One of the oldest established and most celebrated of the European cemeteries, is that of Père la Chaise (q.v.), near Paris, the arrangements of which have been generally followed in the cemeteries of London and other English cities; with, however, this distinct difference, that the English cemeteries are divided into two portions—one consecrated for the burials of members of the established church, over whose remains the funeral service is read, and one unconsecrated for the burials of dissenters. In the Scottish such distinctions are not required, though the Episcopal church has some consecrated burying-places. In the United States, as at Philadelphia and New York, there are cemeteries equal in point of arrangement to any in Europe.

CEMETERY (*ante*). The famous Père la Chaise, in Paris, is the most celebrated of modern cemeteries, although by no means the largest. It was laid out in 1804, and com-

prises about 200 acres, and more than 16,000 monuments erected to the memory of nearly all the great men of France of the present century. Twice this C. and the neighboring heights have been the scene of desperate fighting. In 1814, during the attack on Paris by the allies, it was stormed by a Russian column; and in 1871 the communists made their last stand among these tombs, where 900 of them were killed, 200 being buried in quicklime in one huge grave, and 700 in another. Paris has also the cemeteries of Mont Parnasse and Montmartre, besides many smaller burial-grounds. In 1874, a very large C. was laid out 16 m. n. of Paris, covering nearly 1300 acres. In France, every city and town is required by law to provide a burial-ground beyond its barriers, properly laid out and planted, and each interment must take place in a separate grave. This law does not apply to Paris, however. There the dead are buried 40 or 50 at a time in the *fosses communes*, the poor being interred gratuitously, and a charge of 20 francs being made in all other cases. The *fosse* when full is left undisturbed for 5 years; then all the crosses and other memorials are removed, the level of the ground is raised 4 or 5 ft. by fresh earth, and interments begin again. For 50 francs a grave can be leased for 10 years; but when permanent monuments are desired the ground must be purchased in fee.

In English cities, about 1840, the people began to discuss the dangers to public health arising from the condition of the grave-yards surrounding, and the vaults within and underneath, the great churches. In London, these receptacles were literally crammed with coffins, and the surrounding air was infected to a dangerous degree. Coffins were piled upon each other until they came within a few inches of the surface of the ground, and then the ground was raised from time to time until its level came nearly up to the lower windows of the church. To make room for new burials, old bones were thrown out, and this led to systematic robbing of graves for the sake of the coffin plates and the pretty ornaments sometimes buried with the bodies. The result of this action and discussion was an entire change in the system. Burials within the limits of cities and villages were prohibited, and as a necessity rural cemeteries were founded. The chief cemeteries of London at present are: Kensal Green, on the Harrow road, 2½ m. from Paddington; Highgate, on a slope of Highgate hill; Abney Park; the Norwood and Nunhead cemeteries, on the s.; the west London C., at Brompton; Ilford and Leystone cemeteries in Essex; the Victoria and Tower Hamlets cemeteries in e. London; while farther from the city were the cemeteries of Woking and Colney Hatch.

The dead-houses (Leichenhauser) of Frankfort and Munich form a remarkable feature of the burial customs of those cities. The objects of the founders were to obviate the remotest danger of premature interment, and to provide a respectable place for the reception of the dead, in order to remove the bodies from the often confined dwellings of the friends. At Frankfort, the dead-house is at the entrance to the cemetery. It consists of a warder's room, where an attendant is always on duty; on each side are five rooms, well ventilated, and kept at even temperature, and each one is furnished with a bier, on which a corpse can be laid. On one of the fingers of a corpse is placed a ring, to which is attached a light cord, connecting with a bell which hangs outside of the attendant's room. Bodies deposited here are inspected at regular intervals by a medical officer, and the warden is always on the watch for the ringing of the bell. The importance of this care was once proved at Frankfort by the revival of a child. The attendants are required to receive and treat the dead with all respect, and no interment is permitted until signs of decomposition appear. The relations are then notified, and a funeral is held. Similar mortuaries have been established in many English towns.

Of the cemeteries still in use in southern Europe, the catacombs of Sicily are the most remarkable. In one of these, near Palermo, under an old Capuchin monastery, there are four subterranean corridors, in which more than 2,000 corpses are ranged in niches in the wall, many of them shrunk into the most grotesque attitudes, or hanging with pendent heads or limbs from their receptacles. As a preparation for its niche, the body is desiccated in an oven, and then dressed as if in life and put in its place in the wall. At one end of this C. there is an altar, strangely ornamented with a mosaic of human skulls and bones.

Among nations in the east cemeteries have been in use from the earliest times. In China the high grounds near Macao and Canton are crowded with tombs, many of them in the form of small tumuli with a low encircling wall, like the ringed barrows of western Europe. But the most picturesque of all cemeteries are those of the Turks. From them it was, perhaps, that the first idea of the modern C., with its ornamental plantations, was derived. Around Constantinople the cemeteries form vast tracts of cypress woods, under whose branches stand thousands of tombstones. A grave is never reopened; a new resting-place is given to every one, and so the dead now occupy a wider territory than that which is covered by the homes of the living. The Turks believe that until the body is buried the soul is in a state of discomfort, and the funeral, therefore, takes place as soon as possible after death. No coffin is used; the body is laid in the grave, a few boards are placed around it, and then the earth is shoveled in, care being taken to leave a small opening extending from the head of the corpse to the surface of the ground, an opening not unfrequently enlarged by dogs and other beasts which plunder the graves. A tombstone of white marble is then erected, surmounted by a carved turban, in case of a man, and ornamented by a palm branch in low relief, if the grave be that of a woman.

The turban by its varying form indicates not only the rank of the sleeper below, but also the period of his death, for the fashion of the Turkish head-dress is always changing. A cypress is usually planted beside the grave, its odor being supposed to neutralize any noxious exhalations from the ground, and thus, every C. is a forest, where by day hundreds of turtle-doves are on the wing or perching on the trees, and where bats and owls swarm undisturbed at night. These cemeteries are a favorite resort for Turkish women, some of whom are always to be seen praying beside the narrow openings that lead down into a parent's, a husband's, or a brother's grave. The cemeteries of the Armenians abound in bas-reliefs, which show the manner of the death of the person beneath, and on these singular tombstones are frequent representations of men being decapitated or hanging on a gibbet.

America closely followed England in the sanitary reform of burial-places, and many years ago burial within certain limits of cities was prohibited except in special cases, such as the use of private vaults in church-yards. The earliest of the great cemeteries in the United States was Mount Auburn, near Boston, covering 125 acres, lovely by nature, and most elaborately adorned.

Laurel Hill C., in Philadelphia, was opened in 1836. It is on the Schuylkill river, about 4 m. n. of the center of the city, and is part of a region of romantic beauty, abounding in gentle declivities, picturesque lawns, rugged ascents, rocky ravines, and flowery dells. A carriage drive, along the river front, connects Fairmount park and the Wissahickon; thus bringing the ever-varying activity of the living into association with the tranquil resting-places of the dead. Since the first purchase of ground, several larger tracts have been added to it; while, under the management of various associations, other portions of the beautiful vicinity have been, in a similar manner, consecrated and adorned. This was followed by Greenwood C., the first and one of the greatest popular burial-places for New York and Brooklyn. The company was chartered in 1838. The grounds, which comprise 450 acres, occupy the hills and valleys on the e. side of the bay of New York, about 3 m. s. of the city hall in Brooklyn. The situation is one of the finest in all the region. From the higher points of the C. the eye takes in the two cities of New York and Brooklyn, the bay, half a dozen cities in New Jersey, the far-off Palisades, the broad lower bay, the highlands near Sandy Hook, Coney island, the rich garden lands of Kings county, and a grand view of the Atlantic ocean. This C. has five entrances; nearly 20 m. of stone-bedded avenues, and 17 m. of concrete paths. Water for drinking and irrigation is supplied from the city works to nearly 40 hydrants. There are eight lakes of varying dimensions, and four ornamental fountains. The grounds are drained by 17 m. of subterranean sewer pipes, with 1140 receiving basins. There have been 23,000 lots sold, and over 200,000 interments made, the first one on the 5th of Sept., 1840. Among the edifices and monuments of note are: the entrance buildings, the receiving tomb, the shelter house, and the following monuments and statues: to Horace Greeley, statue of a printer setting type; to John Matthews, a sarcophagus with marble effigy; of the Brown brothers, representing the loss of the steamship *Arctic* and the loss of five members of the family; on Highwood hill, a tribute to Samuel B. Morse, inventor of the telegraph; the Firemen's monument, a fireman rescuing a child; monument to Henry Howard, ex-chief of the New York fire department; chapel monument to Mary M. Danser, noted for charitable bequests; marble temple of A. S. Scribner, of fine Italian marble, containing a figure of *Hope*, under a marble canopy, supported on eight pillars, and on the sides, in bas-relief, illustrations from the life of Christ, from birth to ascension; monument to Thomas J. Read, a granite figure of *Faith Clasping the Cross;* statue of John Correja, a sea-captain taking an observation with the sextant (put up by himself many years before his death); the monument to Charlotte Canda, who was killed on her 17th birthday by falling from her carriage. (This is an elaborate Gothic temple, and was for many years the great attraction of the place; more people have visited this structure, probably, than any other of the points of interest.) The Soldiers' monument, in honor of those who fell in the union cause during the rebellion, with four life-size statues representing the different branches of the service; the Pilots' monument, to Thomas Freeborn, who lost his life in trying to save the ship *John Minturn*, in 1846; the statuary group of James Gordon Bennett, founder of the New York *Herald*, of the finest Carrara marble, representing a life-sized female figure, kneeling on a cushion, in an attitude of prayer, commending to the Almighty Giver her child held in suspense by an angelic figure; the colossal bronze statue of De Witt Clinton; monument to Louis Bonard, who was one of the founders of the society for the prevention of cruelty to animals. This C. is not a stock corporation, but a public trust, managed by trustees chosen by the lot owners. Many similar cemeteries, large and beautiful, have since been established.

CENCI, Beatrice, called "the beautiful parricide," was the daughter of Francesco Cenci, a wealthy Roman nobleman. According to Muratori (*Annales*, lib. x.), Francesco was twice married, Beatrice being his daughter by the first wife. After his second marriage, he treated the children of his first wife in a revolting manner, and was even accused of hiring bandits to murder two of his sons on their return from Spain. The beauty of Beatrice inspired him with the horrible and incestuous desire to possess her person; with mingled lust and hate, he persecuted her from day to day, until circum-

stances enabled him to consummate his brutality. The unfortunate girl besought the help of her relatives, and of pope Clement VII. (Aldobrandini), but did not receive it; whereupon, in company with her step-mother, and her brother, Giacomo, she planned and executed the murder of her unnatural parent. The crime was discovered, and both she and Giacomo were put to the torture; Giacomo confessed, but Beatrice persisted in the delaration that she was innocent. All, however, were condemned, and put to death, August, 1599, in spite of efforts made in their behalf. Such is Muratori's narrative. Others allege that Beatrice was the innocent victim of an infernal plot. The results of Bertolotti's investigations (*Francesco Cenci e la sua Famiglia*, 1877), based on original documents and contemporary notices, go far to deprive the story of the Cenci tragedy of the romantic elements on which Shelley's powerful tragedy mainly turns. Francesco, it would appear, was profligate, but no monster; Beatrice at the time she murdered her father, was not 16 but 21 years of age, was far from beautiful, and probably had already a tarnished moral reputation. And Bertolotti is further convinced that the sweet and mournful countenance which forms one of the treasures of the Barberini palace in Rome, is not only not the portrait of Beatrice, but was not even painted by Guido, to whom it has long been unhesitatingly attributed.

CENEDA, now officially called VITTORIO, a city of northern Italy, province of Treviso, 36 m. n. of Venice. Pop. 10,530. It is an episcopal see, has a very handsome modern cathedral and a fine monolithic fountain. Under the republic of Venice it was rich, and famed for its manufactures of woolen cloth, silk, and paper. C. is very ancient, dating from the time of the Romans, but now it is a decayed city.

CENIS, MONT, or MONTE CENISIO, a mountain-pass of the Alps, between Savoy and Piedmont, forming part of the water-shed between the valleys of the Doire and the Arc. The culminating point of the pass reaches an elevation of 6,775 ft. above the sea. Schist, limestone, and gypsum, in altenate beds, compose the strata of the mountain, the vegetation of which is rich in the rarer kinds of Alpine plants. Over the pass a road was constructed (1803–10) by the chevalier Fabbroni, under Napoleon's orders, at an expense of £300,000. This is the safest, and most frequented road across the Alps. Near the pass, a railway tunnel, 7½ m. long, was finished in 1870. For detail see TUNNEL.

. CENIS, MONT (*ante*), the site of some remarkable railroad building within the last 15 years. In 1865, an English engineer obtained permission from the Italian and French governments to lay a railway on the line of Napoleon's carriage road over the mountains. The road was built in the ordinary way with the addition of a third rail midway between the outer ones, and raised nearly a foot higher. This third rail was strongly gripped by the driving wheels, by which means the trains could safely traverse very sharp curves and descend grades as steep as 1 ft. in 12. On the French side the rise to the summit in 6¾ m. of road was 4,460 feet. Then there was a stretch of 5 m. nearly level, and after that the descent to Susa on the Italian side, a distance of 20 m. over curves so numerous and so sharp that the view changed almost every minute, trains descended by the momentum of weight, the speed being regulated by brakes. This road was superseded by the one now in use, which runs through the great tunnel. (See TUNNEL, *ante*.)

CEN'OBITES. See MONACHISM.

CENO'MYCE. See REINDEER MOSS.

CENO'TAPH (Gr. *kenotafion*, from *kenos*, empty, and *tafos*, a tomb), a monument which does not contain the remains of the deceased. They were originally erected for those whose bones could not be found, e.g., for those who had perished at sea. Latterly, the name was applied to tombs built by a man during his lifetime, for himself and the members of his family.

CENSER (Fr. *encensoir*, from Lat. *incendo*, to burn), a vase, or other sacred vessel, used for burning perfumes. See INCENSE. Censers were much used in the Hebrew service of the temple, but their form is not accurately ascertained, and it is probable that they varied in this respect, according to the occasions on which they were used. The C., called also a *thurible* (Lat. *thuribulum*, from *thus*, frankincense), is used in the Roman Catholic church at mass, vespers and other offices. It is suspended by chains, which are held in the hand, and is tossed in the air, so as to throw the smoke of the incense in all directions. It varies very much in form.

CENSORI'NUS, a chronologist and grammarian of the 3d c., known by a work called *De Die Natali*, in which he treated of man's generations, his natal hour, and the influence that the stars and genii exercise over his fate. It was by some work of his on chronology that certain important dates have been ascertained.

CENSORS, the name of two Roman officers of state. The office was established by Servius Tullius, the fifth king of Rome. After the expulsion of the kings, it was held by the consuls, special magistrates not being appointed till 443 B.C. It continued to be filled by patricians till 351 B.C., when C. Marcius Rutilus, a plebeian, was elected. Twelve years later, it was enacted that one of the C. (there were always two) must be a plebeian. In 131 B.C., both C. for the first time were plebeians. The C. were

elected in the *comitia centuriata*, presided over by a consul. The term of office at first lasted five years, but was shortly afterwards limited to 18 months. The censorship was regarded as the highest dignity in the state, except the dictatorship. It was a sacred and irresponsible magistracy, whose powers were vast and undefined, and whose decisions were received with solemn reverence. The duties of the C. were threefold. 1. The taking of the census, or register of the citizens and of their property. 2. The *regimen morum* (regulation of morals). 3. The administration of the finances of the state. The taking of the census (Lat. *censeo*, to value, to take an account of) was originally their sole function (hence their name), and was held in the campus martius, in a building called *villa publica*. The *regimen morum* was the most dreaded and absolute of their powers. It grew naturally out of the exercise of the previous duty, which compelled them to exclude unworthy persons from the lists of citizens. Gradually, the superintendence of the C. extended from the public to the private life of citizens. They could inflict disgrace (*ignominia*) on any one whose conduct did not square with their notions of rectitude or duty. For instance, if a man neglected the cultivation of his fields, or carried on a disreputable trade, or refused to marry, or treated his family either too kindly or too harshly, or was extravagant, or guilty of bribery, cowardice, etc., he might be degraded, according to his rank, or otherwise punished. *The administration of the finances of the state* included the regulation of the *tributum*, or property-tax; of the *vectigalia*, such as the tithes paid for the public lands, salt-works, mines, customs, etc., which were usually leased out to speculators for five years; the preparation of the state budget, etc.—See Rovers, *De Censorum apud Romanos Auctoritate et Existimatione* (Utrecht, 1825).

CEN'SORSHIP OF THE **PRESS,** the term generally applied to the arrangements for regulating what may be printed, in countries where the press is not free. The simplest form of C. is when a public officer—the censor, or licenser, as he is sometimes called—reads over the MS. to be printed, and, after striking out any objectionable passages, certifies that the work may be printed. Thence it is common in old books to see the word *imprimatur*—let it be printed—followed by one or more signatures. Though it has its name from an analogy with the functions of the Roman censor, the C. did not come into operation until the invention of printing. It was common to all European countries, Great Britain included. The C. was established by act of parliament in 1662, 13 Char. II. c. 33 : "An act for preventing the frequent abuses in printing seditious, treasonable, and unlicensed books and pamphlets, and for regulating of printing and printing-presses." This was a temporary act, renewed from time to time; and its renewal was refused in 1693, owing to a quarrel between the house of commons and the licenser. Since that time there has been, generally speaking, no restriction in this country on what any man may publish; and he is merely responsible to the law, if in his publication he should commit any public or private wrong. See LIBEL, LAW OF; see also PRESS, FREEDOM OF THE; BOOK-TRADE; and COPYRIGHT.

CENSUS means, in this country, the periodical counting of the people. It is a Latin word applied by the Romans to one of the functions of their censors (q. v.). They had to enumerate the people, but only for immediate purposes of taxation, so that no accounts of the results of such enumerations has been preserved. The idea of ascertaining the numbers of the people, and the proportions in which they are divided according to sex, age, profession, rank, and the like, as statistical information, is of late origin. The first C. of Britain was taken in the first year of the present c.—1801. From that time it has been taken at each period of ten years. An attempt, but a rather unsuccessful one, was made to take the statistics of Ireland in 1811. Ten years after, the attempt was repeated, but the accuracy of the bare enumeration it furnished was doubtful. That of 1831, which was an improvement, was corrected three years after, in order that it might form the basis of a new system of education. The four subsequent enumerations have been very trustworthy, and have furnished besides valuable statistics regarding the agricultural condition of the country. The system of registration under a registrar-general, established in England in 1836, has given considerable assistance by supplying a staff for carrying out the enumeration, and also by affording the means of checking the census. A similar registration system was extended to Scotland in 1854, of which the C. of 1861 and 1871 have had the advantage. A C. must be taken for the whole empire simultaneously, otherwise it cannot be accurate. The practice is for the enumerating officer in each petty district to leave a schedule at each house, which he receives filled up, aiding, when necessary, in the filling up. The C. of 1851 was taken for the night of the 31st March. This C. supplied important, but not altogether satisfactory information, as to the educational and ecclesiastical condition of the country, elements of which the latter has been left out in 1861 and 1871. The C. of 1861 was taken for the night of Sunday, 7th April; that of 1871 for the night of Sunday, 2d April, a schedule being left in each house on the Saturday, and called for on Monday. The schedule of 1871 contained compartments for "particulars of the name, sex, age, rank, profession or occupation, condition, relation to head of family, and birthplace of every living person" who passed the night of Sunday in the house; whether any was blind, deaf, dumb, imbecile, or lunatic; and how many between the ages of 6 and 13 were receiving education. Most civilized nations take a C. at regular intervals—France,

every five years, the last in 1872; Belgium, every ten years, the last in 1866, with calculated estimate in 1873; Austria, every ten years, the last in 1869; the United States, the same, the last in 1870; in Germany, the last two censuses were taken in 1871 and 1875. The first C. for India was taken between 1867 and 1872.

CENSUS (*ante*). The tenth C. of the United States was taken in June, 1880. Up to 1860 our decennial progress in population and material wealth had been uniformly rapid and wonderful. The war of the rebellion then interfered, and both directly and indirectly tended to arrest that progress—directly in the destruction, through war and disease, of more than three quarters of a million of men in the beginning of life, when, in the natural course of events, they would have largely increased the population; and indirectly in checking the flood of immigration, a flood that had been bringing us half a million inhabitants in a single year. The regularity of progress from 1790 to 1860 is very remarkable. The percentage of increase in each decade is here shown:

Decade.	Per Cent.	Decade.	Per Cent.
1790 to 1800	35.02	1830 to 1840	32.67
1800 to 1810	36.45	1840 to 1850	35.87
1810 to 1820	33.13	1850 to 1860	35.58
1820 to 1830	33.49	1860 to 1870	22.22

So, for the 70 years up to 1860 the population grew at an average rate of 3½ per cent per annum, dividing the whole period into periods of ten years each. Without the war the population of the United States in 1870 would have been 42,600,000; in 1880, by the same ratio, it would have been upward of 57,000,000. Per centage of increase, 1870–80, 23.04.

The numbering of the people, though on one special occasion forbidden by the highest power, is an ancient custom. Moses numbered the Israelites in the wilderness, and, in later times, Joshua and David followed his example. The Chinese tell of a C. of their people taken 2,042 years before the birth of Christ. In Japan an enumeration was made about 1,900 years ago. Solon ordered the C. of Athens to be taken, especially with reference to classes of the people and taxable property. Servius Tullius, sixth king of Rome, ordered a C., when every citizen had to appear on the field of Mars and declare on oath his name and residence, the number and names of his children, and the value of his property. Failing to do this, his property might be confiscated and himself scourged and sold for a slave. Augustus enlarged the scope and improved the manner of taking the census. In the 16th c. the church began to record births, marriages, and deaths, and from this practice gradually grew up the modern C., though there does not appear to have been any exact popular C. made until after the beginning of the 18th century.

Russia, then almost a barbarous country, appears to have led other nations in C. taking. Partial enumerations were made in 1700, 1704–5, and 1710. In 1719, Peter the great sent a commission into all the provinces to make a general census. This commission took account of the number of peasants, mechanics, domestics, and men unemployed. Women were not taken into account at all at the commencement, but they were recognized before the work closed, and in some districts were partially enumerated. In 1722, the C. distinguished the insane and infirm without means of subsistence, and the czar ordered that a C. should be taken every twentieth year. In 1802, a central bureau of statistics was organized, reorganized in 1852, and again in 1858. This bureau is charged with the taking of the C., which now includes much the same information as that obtained in the United States. Prussian enumerations were begun under Frederick William I., and improved by his successor. From 1748 to 1800, the C. was taken annually, except when prevented by war. In 1805, the central bureau of statistics was established. In 1834, a triennial C. was ordered. The schedules for questioning were very full, and the enumeration was to be made some one day in December. The first C. of the German empire was taken on the 1st of Dec., 1871. Austria first took a C. in 1754, and kept it up triennially until 1857, when it was enacted that the enumeration should be made every sixth year. In Sweden, as early as 1686, there was a law requiring the clergy to record marriages, legitimate and illegitimate births, deaths, persons removed from or settled in parishes, and all the population, arranged by place of habitation and households. Such information was first published in 1746. A statistical bureau was established in 1857, to collate and publish C. and other statistical information. Norway has kept up a decennial C. since 1815, and the work is usually thoroughly done. In Spain, enumerations were made in 1787, 1798, 1857, and 1860, and, by calculation, in 1867. The work is done by government officials in one night. Denmark had a C. once in five years, from 1840 to 1860; now it is decennial, the last enumeration being on the 1st of Feb., 1870. The first and only C. of Portugal was made Jan. 1, 1864, and extended only to the number of the population. Switzerland began enumerations about 1750. Her C. is now decennial. Belgium doubtless leads all nations in the fullness and accuracy of her statistics, although her C. is taken but once in ten years. The last was in 1876. The Netherlands C. is decennial. The last was taken Dec. 1, 1870. Italy has an enumeration once in ten years, the last Dec. 31, 1871. Greece counts up irregularly. From 1836 to 1845, a C. was made every year; then in 1848, 1853, 1856, 1861, 1868, and 1870. Turkey has never taken a C. except for conscription or taxation. The first C.

on record in France was taken in 1700 and published in 1720. There was a general C. taken in 1800, and a decree of the national convention ordered that it should be continued every fifth year. Since about 1820, the C. has been taken very regularly. Brazil began in 1872, the Argentine Republic in 1869, Colombia in 1870, and Egypt in 1862.

The first real effort to record the population of Great Britain was made in 1801, and then it did not extend to Ireland, which had just become a part of the empire by the celebrated union. This C. was crude and unsatisfactory, and the returns were impossible of classification. The chief value of the C. of 1801 was in calling attention to the importance of such statistics and evoking better methods for getting and classifying them. Much better work was done in 1841 and 1851, when advantage was taken of the elaborate records of births, marriages, and deaths, which were begun the 1st of July, 1837. The first attempt at a general C. in Ireland was made in 1811, but it was a failure. Some improvements were made in 1821 and 1831, since which satisfactory enumerations have been made by the constabulary. We lack space to go over the enumerations in Great Britain and Ireland in 1841, 1851, and 1861, and must come directly to the first imperial C.—1871. This first attempted complete enumeration of the population of the empire was, so far as Great Britain and Ireland were a part, made in one day, April 3, 1871. The returns for the whole empire showed a population of 234,762,593, living upon 7,769,449 sq.m. of territory, viz.:—England and Wales, 22,856,164 population; Scotland, 3,392,259; Ireland, 5,449,186; islands in British seas, 147,470; colonies and possessions, 202,917,214. The annual rate of increase from 1861 was:—In England and Wales, 1.23 per cent; Scotland, 0.92; Ireland (decrease), 0.71. The work of this C. was in charge of the registrar-general, assisted by Dr. W. Farr and J. T. Hammick. The main work was done by 32,543 enumerators, employed under 2,195 registrars and 626 superintendent registrars. All the enumerators were required to be intelligent, trustworthy, and active; to write well, and to have some knowledge of arithmetic. They were to be not under eighteen nor over sixty-five, and to be in good health and of unexceptionable character. The whole country was divided into minute districts, and so great was the care taken, that every unnumbered house or dwelling had a fixed number put upon it before the schedules were sent out. Every means was taken through the press and by means of special publications to apprise the people of what was wanted, and instructing them how to facilitate the work. The householders' schedules were delivered in person by the enumerators who were to take them up. Every separate occupier received a schedule arranged so as to record the name, day, age, rank, profession or occupation, conjugal relation, relation to the head of the family and birthplace of every person who abode in any house on the night of Sunday, 2d of April, 1871. There were special blanks for blind, deaf and dumb, etc. There were 6,500,000 of these schedules, weighing 41 tons. In addition to schedules and enumeration books, there were sent from the central office 115 different printed forms of instructions and circulars. The houseless population were enumerated by the police, the navy by the admiralty, the merchant seamen by the customs bureau, and the army through the field-marshal's office. The tenacity of the Welsh tongue was shown by the return of 17,276 schedules filled out in that language. The care exercised in taking this enumeration may be inferred from the fact that the enumerators were instructed to consider a house as comprising all the space within the external and party walls of a building, whether occupied by one or several families; they were also instructed to make an exact record of each house and the number of schedules left. With the help of the police they were to return all persons not on that night dwelling in houses, but sleeping in barns, sheds, caravans or tents, or in the open air. Special schedules were printed for the enumeration of persons in public institutions, on board vessels, or in charge of boats and barges employed in inland navigation. Persons traveling during the night of Sunday, April 2, were to be included in the schedules of the hotel, or the house at which they arrived on the morning of Monday. Persons engaged in work away from home during the night of Sunday were to be included in the schedule left at the house where they usually resided. The causes why an unusual number of persons were present or absent at any given places were to be reported. The expedition with which the enormous mass of information was assorted and compiled may be known from the fact that the abstract showing the population of Great Britain was laid before parliament in print on the 20th of June, only eleven weeks from the day for collecting the schedules. The C. of Ireland at the same time was taken by 4,536 members of the royal constabulary, aided in cities by the local police. In Scotland there were 1016 local registrars, and 8,342 enumerators. The cost of this imperial C. was, in England, £5 5*s.* 7¾*d.* for each 1000 of population; in Scotland, £8 1*s.* 4*d.*; in Ireland, £7 2*s.* 7*d.*

Census work began in the United States with the beginning of the government. In order to secure a proper apportionment of representatives in the lower house of congress a C. is taken every tenth year. At first it was nothing more than an enumeration of the people, classifying slave and free. Additions and improvements were made until the schedules of 1870 comprised questions as to name, age, sex, color, conjugal condition, place of birth and place of birth of father and mother. To these were added particulars as to schools, libraries, newspapers, churches, disease and mortality, pauperism and crime, school, military and citizenship ages; areas of farms, families and dwellings;

the blind, deaf and dumb, insane and idiotic, occupations of the people, wealth, taxation, and public indebtedness, and the amount and value of the products of agriculture and manufactures. The questions were certainly comprehensive enough, but the mode of taking the C. was slow, cumbrous, and unsatisfactory. It was two years and six months after the beginning of the work when the compilation known as the *Compendium* was sent to congress. In the introduction to this compendium gen. Walker, superintendent of the ninth C., says: "There is no reason, however, why, with such modifications of existing laws as would insure that the material should come originally to the census office in proper shape for tabulation, the entire compilation should not be concluded within a year from the date of the first receipt of returns. It is not possible for one who has had such painful occasion as the present superintendent to observe the workings of the census law of 1850, to characterize it otherwise than as clumsy, antiquated and barbarous. The machinery it provides is as unfit for use in the C. of the United States, in this day of advanced statistical science, as the smooth-bore muzzle-loading queen's arm of the revolution would be for service against the repeating rifle of the present time. It ought not to be possible that another C. should be taken under this law; such a thing ought not to be seriously proposed. The country has suffered more than enough already of discredit and of loss on account of the wretched insufficiency and inappropriateness of the provisions of this ill-constructed and outgrown statute."

In 1850 Mr. Joseph C. G. Kennedy, who superintended the C. of that decade, ventured to prophesy our future population, basing his estimates upon the progress already achieved. Of course, he did not make allowances for the war, then undreamed of. He reckoned that in 1870 we should have a population of 42,328,432, and in 1880 it would rise to 56,450,241. His estimates were high, but without the war we should probably have come well up to them. Taking the whole country, we lost through battle and diseases consequent upon military service more than a million of men; and these were men in the prime of life—just the period for natural increase of families. Three times as many, who did not lose their lives, were away from their homes one, two, or three years, and this, too, greatly reduced natural increase.

CENT (*ante*), a coin of the United States valued at the hundredth part of a dollar. The first one authorized by act of congress, April 2, 1792, was copper, and weighed 264 grains. The next year the weight was reduced to 208 grains, and in 1796 to 168 grains. Half cents were also coined, but not to great extent. Collectors of coins should remember that no coins other than gold or silver were issued from the United States mint in the year 1815 or 1832. By the act of Feb. 21, 1857 the issue of half cents was discontinued, and the copper C. was made of .88 copper and 12 zinc, and to weigh 72 grains. April 22, 1864, the bronze C. was introduced, consisting of .95 copper and .5 tin and zinc, and weighing 48 grains. Ten of the present cents weigh just a troy ounce, and 120 cents weigh a troy pound. They cannot be conveniently used for avoirdupois or common weight. Cents are legal tender to the amount of 25 cents.

CENTAU'RÉA, a genus of plants of the natural order *compositæ*, sub-order *cynaraceæ*, containing many species of annual and perennial herbaceous plants, chiefly natives of the temperate and cold regions of the eastern hemisphere. Six or seven species are natives of Britain, some of them common weeds, whilst some species appear among the frequent ornaments of flower-gardens.—The BLUE-BOTTLE, or CORN BLUE-BOTTLE (*C. cyanus*), is common in cornfields in Britain and other parts of Europe, and has now become frequent also in similar situations in America, and indeed over the greater part of the world. It is an annual, growing to the height of about 2 ft., and producing its flowers in July and August. The florets of the disk are small and purple; those of the ray are few, comparatively large, and of a bright blue. Its flowers have long been much used in wreaths and garlands. It is common in gardens, with flowers variously modified by cultivation. Water distilled from the flowers of the blue-bottle was at one time in high repute as a remedy for weak eyes. The juice of the florets of the disk, with a little alum, dyes a beautiful and permanent blue.—The large blue-bottle (*C. montana*), a native of central Europe, is still more frequently cultivated in flower-gardens. Its flowers are considerably larger, and it is a perennial.—SWEET SULTAN (*C. moschata*), a native of the Levant, with fragrant flowers, is also common in flower-gardens. It is an annual or biennial.—Several species, having the involucre spiny, bear the name of STAR-THISTLE. The common STAR-THISTLE (*C. calcitrapa*) is a native of the southern parts of Britain and of Europe.—The common or black KNAPWEED, called in Scotland *horse knot* (*C. nigra*), is abundant in the meadows and pastures of most parts of Britain, and is a troublesome perennial weed, difficult of extirpation. *C. jacea*, also called KNAPWEED, more rare in Britain, is very common in some parts of Europe, and its bitter astringent root, and indeed the whole plant, were formerly used in medicine. It affords a beautiful bright yellow dye, almost as good as saw-wort.—The name C. has its origin in an ancient legend concerning the cure of a centaur by one of the species.

CENTAURS ("bull-killers"), a wild race of men who inhabited, in early times, the forests and mountains of Thessaly, and whose chief occupation was bull-hunting. Homer, the first who mentions them, describes them merely as savage, gigantic, and covered with hair. They do not appear as monsters, half-man and half-horse, until the

age of Pindar. The C. are celebrated in Greek mythology on account of their war with the *Lapithæ* (q.v.), and their contest with Hercules. The fact lying at the bottom of Pindar's myth may refer to the impression which the old bull-hunters of Thessaly, who spent almost their whole life, it is said, on horseback, first made on some of the neighboring tribes—viz., that the man and the horse were one creature, which, at least, we know was the opinion entertained by the Mexicans of the Spanish cavalry. On account of their resemblance to the Satyrs, the C. were at a later period introduced into the artistic representation of the Bacchic worship.

CENTAU'RUS, the *Centaur*, one of the constellations in the southern hemisphere, represented on the celestial globe by a form half-man and half-horse. The stars in this constellation are, according to Ptolemy's catalogue, 37 in number; according to the Britannic catalogue, 35. It contains the stars α Centauri and β Centauri, both of the first magnitude.

CEN'TAURY, *Erythræa*, a genus of plants of the natural order *gentianeæ*, having a funnel-shaped regular 5-partite corolla. The species are pretty little annuals, natives chiefly of the temperate parts of Europe and Asia, with pink or rose-colored flowers. They possess the tonic and other medicinal virtues of gentian, and although not frequently administered by physicians, are an important domestic medicine; and the tops are collected, when the plant is in flower, by the country people both in England and on the continent of Europe, to be employed in cases of dyspepsia, in intermittent fevers, and as a vermifuge. They contain a substance called *centaurine*, the hydrochlorate of which is said to be an excellent febrifuge.—The common C. (*E. centaurium*) is the species most frequent in Britain; a plant of 8 in. to a foot in height, with flowers collected in loose heads, growing in dry pastures. Two or three other species are found on sandy sea-shores. Nearly allied to these is the AMERICAN C. (*sabbatia angularis*), an annual plant with an erect quadrangular stem, extensively distributed throughout the United States and Canada, and much used in the domestic practice of America, as a prophylactic against autumnal fevers in strong infusions and large and repeated doses. The name C. owes its origin to the same legend with the name *centaurea*, although appropriated to plants so different.

CENT and **CENTIME'** (Lat. *centum*, a hundred), names of coins. The Dutch cent is a copper coin $=\frac{1}{100}$th of the guilder, which is equal to 1*s.* 8*d.* sterling. In the U. S. of America, the cent is a copper coin $=\frac{1}{100}$th part of the dollar, or nearly one half-penny English. The centime is the 100th of the French franc (q.v.), and is of the value of $\frac{1}{10}$th of an English penny.

CENTE'NES. See TENREC.

CENTENNIAL EXHIBITION, in the United States, held at Philadelphia in 1876, a hundred years after the declaration of independence. It was opened in Fairmount park, May 10, 1876. An area of 236 acres was used, and the cost of the five main buildings was $4,500,000. Before the close there were more than 200 separate buildings within the inclosure. Some idea of the magnitude of the preparations may be obtained from the apportionment of space in the main building, designed for the exhibition of the manufactured products and products of mines and metallurgy, as well as the condition of science and education in all nations. This building covered 20 acres, and was 1880 ft. long and 464 wide, with projecting wings in the center of the sides 416 ft. long, and in the center of the ends 216 ft. long. The exhibition space was on one floor. The roof of the main portion was 70 ft. high. In the center was an elevated square, with sides of 184 ft., having towers 120 ft. high and 48 ft. square at the corners. At the four corners of the building were towers 75 ft. high. The roof was supported by wrought-iron roof-trusses resting upon 672 wrought-iron columns. The sides were closed with glazed sash, above a substructure of brick 7 ft. high, resting on a foundation of massive masonry. Space was apportioned as follows, in square feet: Argentine Republic, 2,861; Austria-Hungary, 24,727; Belgium, 15,598; Brazil, 6,899; Canada, 24,118; Chili, 3,244; China, 6,628; France, 45,460; Germany, 29,629; Great Britain and Ireland, 54,155; India and British colonies, 24,193; Hawaiian islands, 1575; Italy, 8,943; Japan, 17,831; Luxemburg, 247; Mexico, 6,567; Netherlands, 15,948; Norway, 6,959; Orange Free State, 1058 Peru, 1462; Spain and colonies, 11,253; Sweden, 17,799; Switzerland, 6,693; Tunis, 2,015; Turkey, 3,347; United States, 136,684. Within this vast space the nations vied with each other in showing proofs of their industry, wealth, and greatness. A most interesting part of the exhibition was that devoted to the progress of modern education. Another building was the women's pavilion, covering an acre of ground, designed to receive the products of woman's ingenuity and progress. Besides the United States more than a dozen other nations were here represented. This was the first collective display of women's work ever attempted. The art building was called Memorial hall, and remains as a permanent monument of the exhibition. It is a splendid structure, in the renaissance style. On a central tower 150 ft. high stands a colossal statue of America; at the base are four figures of smaller proportions, representing the four quarters of the globe. The building is 365 ft. long by 210 wide, and 59 high; it is of granite, glass, and iron. Machinery hall, next in size to the main building, was 1402 ft. long by 360 wide, its area, including that of its annex, being nearly 13 acres. Steam, water-power, and

shafting were provided by the commissioners. The United States building was 504 by 306 feet. In it were exhibited, as fully as possible, all the operations of government service, Horticultural hall, in the Moorish style of the 12th c., was built by the city of Philadelphia, and was intended to be permanent. It is of iron and glass, 383 by 193 ft., and 72 in height. Agricultural hall covered a rectangular space 820 ft. long and 540 wide. Great Britain erected three buildings for the use and entertainment of her commissioners; and Germany, Brazil, and Portugal each had a pavilion. The English buildings were fine specimens of the later Tudor architecture. Sweden exhibited a national schoolhouse with educational appliances and furniture complete. France had a building containing charts, drawings, and models of public works. Canada displayed her woods and lumber in log and frame houses. Spain had a soldiers' barracks, and Cuba had an acclimatization garden. Turkey showed in a special building her sponge fisheries. Japan had a model dwelling. Morocco had a Moorish villa for the display and sale of her productions. Chili had a building containing models of amalgamating machines. There were also a number of special edifices belonging to private exhibitors. There was a Turkish café of true oriental type, where Mocha, mastic, Syrian tobacco, and Samian wine were dispensed. There were a Tunisian bazar, and an Algerine pavilion; Japanese booths, houses, and gardens; a New England farmer's home with the old style of kitchen, and other peculiar structures. There were 26 buildings for the headquarters of as many states, some of them containing large exhibitions of state products; several were made of the stone or wood of the state represented. Thirty or more buildings were erected by private companies or individuals. Among them were the telegraph building, the transportation building, the bankers' building, the American kindergarten, the Bible building, and others showing the manufacture of innumerable articles; finally, the ingenuity of man was supplemented by bees making honey in the midst of all the crowd and turmoil. The exhibition was opened to visitors every day except Sunday for six months, closing on the 10th of November. The number of admissions was 9,910,966, of which number 7,250,620 paid the regular fee of 50 cts., and 753,654 the special rate of 25 cts.; 1,906,692 admissions were free, representing exhibitors, officers, employés, the press, and complimentary passes.

CENTER, a co. in middle Pennsylvania, traversed by the Allegheny and other mountain ridges, Bald Eagle creek, and two or three branches of the Pennsylvania railroad; 1000 sq.m.; pop. '80, 37,921. The chief business is agriculture. Coal, iron, and limestone are abundant. Co. seat, Bellefonte.

CENTER OF GRAVITY is that point in a body or system of bodies rigidly connected, upon which the body or system acted upon only by the force of gravity, will balance itself in all positions. Though the action of gravity enters this definition, many of the properties of the point are independent of that force, and might be enunciated and proved without conceiving it to exist. By some, accordingly, the point has been called the *center of magnitude*, and by others, the *center of parallel forces*. Such a point exists in every body and system, and only one such point. Every body may be supposed to be made up of a multitude of minute particles connected by cohesion, and so far as its balance under gravity is concerned, each of these may be supposed to be removed, and its place occupied by a force proportioned to its weight. Instead of the body, on these suppositions, we should then have a system of parallel forces, the lines from the various particles to the earth's center being regarded as parallel. But a system of parallel forces (see PARALLEL FORCES) has a single resultant acting through a fixed point, whose position is independent of the position in space of the points of application of the component forces, provided their relative positions in the system continue unchanged. This

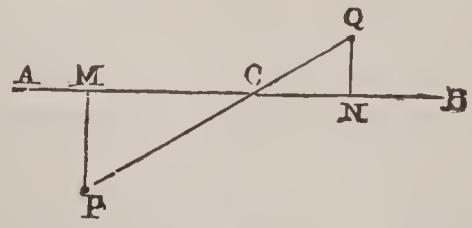


Fig. 1.

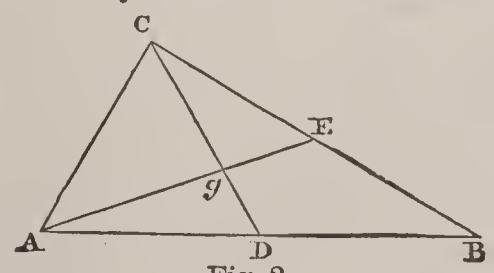


Fig. 2.

point is the C. of G.; and if it be supported, it is clear that the body will balance itself upon it in all positions. The same reasoning obviously applies to any system of bodies rigidly connected. It is usual to demonstrate this and the general rule for finding the C. of G. by proving it first in the case of two heavy particles forming a body or system, and then extending the proof to the case of any number of particles. Let P and Q (see fig. 1) be two heavy particles. Join P and Q, and divide the line PQ in C, so that weight of P : weight of Q : : CQ : CP. Then C will be the C. of G. of P and Q. Draw ACB horizontal, and PM, QN vertical, meeting AB in M and N. Then if P and Q represent the weights of P and Q, we have P : Q : : CQ : CP. But CQ : CP : : CN : CM by similar triangles. Therefore P : Q : : CN : CM, and P.CM = Q.CN. P and Q, therefore, are balanced about C. See BALANCE and LEVER. This is true in all positions of P and Q, for no assumption was made as to their positions. C, therefore, is their center of gravity. Also, we may conceive P and Q to be removed (see PARALLEL FORCES), and in their stead a particle at C equal to them taken together in weight. If

now, the system contained three, it is clear how we should proceed to find its center of gravity; having found the C. of G. of two, we should consider the system as formed of two—viz., the equivalent of the first two at their C. of G., and the third, when the case would fall under that already treated; and so on, extending the rule to a system containing any number of particles. Apart from this rule, however, it is possible, in the case of most regular homogeneous bodies, to fix upon their centers of gravity from general considerations. The C. of G. of a straight line, for instance, must clearly be in its middle point. So the C. of G. of a uniform homogeneous cylinder must be in the middle point of its axis. It must be in the axis, for the cylinder clearly is equally balanced about its axis. It must also be somewhere in its middle circular section, for it will balance itself on a knife-edge under that section. It must, therefore, be in the point where that section cuts the axis, or in the middle of the axis. The C. of G. of a uniform material plane triangle may be found from similar considerations. The triangle ABC (see fig. 2) may be supposed to be made up of uniform material lines parallel to its base AB; each of these will balance upon its middle point. The whole triangle, therefore, will balance upon the line CD, which bisects the base AB and all lines parallel to it. In the same way, the triangle will balance upon the line AE, bisecting BC. But if a figure balances itself upon a line, its C. of G. must lie in that line. The C. of G. of the triangle is therefore in CD, and also in CB. It must therefore be at g where these lines intersect, g being the only point they have in common. Now, by geometry, we know that g divides CD, so that $Cg = \frac{2}{3}$ CD. Hence the rule for finding the C. of G. of a triangle: Draw a line from the vertex, bisecting the base, and measure off Cg, two thirds of the line. g is the center of gravity. By a similar method, the C. of G. of a great number of figures may be determined.

The above method applies only where the figure of the body is regular, and its mass homogeneous. But many bodies, besides being irregular, are formed by the agglomeration of particles of different specific gravities. Of these, the C. of G. can be found only by experiment, though not always satisfactorily. Let the body be suspended by a string, and allowed to find its position of equilibrium. The equilibrium being due to the tension of the string counterbalancing gravity, it follows that the tension is in the same line with that on which gravity acts on the body. But the tension acts on the line of the string, which therefore passes through the center of gravity. Mark its direction through the body. Suspending it then by another point, we should ascertain a second line in which lies the center of gravity. The C. of G., then, must be where these lines intersect.—For the effect on the stability of bodies of the position of the C. of G., see STABILITY.

CENTER OF GYRA'TION is the point at which, if the whole mass of a body rotating round an axis or point of suspension were collected, a given force applied would produce the same angular velocity as it would if applied at the same point to the body itself. The C. of G. bears a strong analogy to the center of oscillation. The cases differ only in this, that in the latter the operating forces are supposed to act at every point of the moving body, while in the former there is only one force acting upon one point. The C. of G. is found by the following rule: Divide the moment of inertia of the rotating mass by the mass of the body, and extract the square root of the quotient. The result is the distance of the point from the axis of rotation. The moment of inertia, it may be stated, is the sum of the products of the weight of each point of the mass by the square of the perpendicular distance of that point from the axis.

CENTERING, the frame-work upon which an arch or vault of stone, brick, or iron is supported during its construction. The simplest form of C. is that used by masons and bricklayers for the arches of common windows and doors. This is merely a deal-board of the required shape, upon the curved edge of which the bricks or stones of the arch are supported until they are keyed in. In building bridges or other structures where arches of great span are to be constructed, the C. is usually made of framed timbers, or timbers and iron combined. The arrangement of the timbers should be such, that the strain upon each shall be mainly a thrust in the direction of its length, for if the strain were transverse, a comparatively slight force would snap it, and if a longitudinal pull, the whole structure would be no stronger than the joints holding the pieces of timber together. In arches of great span, such as that of Waterloo bridge, London, a longitudinal pulling strain is almost inevitable in some parts, as a beam of great length would bend to some extent under a thrusting strain. In such cases great skill and care are demanded in the designing and construction of the joints. As an arch is built from the piers towards the keystone, the weight upon the haunches during construction tends to push the crown upwards, and therefore the problem of designing a framed C. involves the resistance of this tendency, as well as the supporting of the weight of the materials.

The C. of Waterloo bridge, designed by Rennie, presents a fine example of the fulfillment of these requirements. The weight is resisted by direct thrust upon beams passing obliquely downwards from various parts; one of each pair of these oblique beams thrusts outwards, and is directly supported by the abutments; the other thrusts inwards towards a support equidistant from the abutments, the yielding of which is prevented by the longitudinal pull of lower and longer oblique beams. In this, and other modern structures, cast-iron shoes have been successfully used for the tying joints subject to the

longitudinal pulling strain. The flexible C., so called from its yielding at the joints, and varying its form with the load put upon it, is now abandoned. It was chiefly used by French engineers. That of Perronet for the bridge of Neuilly is a celebrated example.

Occasionally, when a very great span is required, and the navigation will permit, piers are built, or piles are driven, to support the C., and the design is much simplified thereby.

Cupolas like the pantheon and St. Peter's at Rome, St. Paul's in London, or the flat domes of the Turkish mosques, require very effective centerings.

CENTER OF **MAGNITUDE** or FIGURE (see CENTER OF GRAVITY). C. of M. is the point on which plane figures and curved surfaces would balance themselves, supposing their areas to have weight. Thus, the center of a circle is its center of magnitude. Otherwise, C. of M. or F. is a point so situated that all straight lines passing through it, and terminated by the circumference or superficies of the figure or surface, are bisected in it.

CENTER OF **OSCILLA'TION.** Referring to the article PENDULUM, the reader will see that the time of a pendulum's vibration increases with its length, being always proportioned to the square root of its length. This is strictly true only of the simple pendulum, in which the pendulous body is supposed to have no determinate magnitude, and to be connected with the point of suspension by an inflexible wire without weight. If, however, the vibrating body have a determinate magnitude, then the time of vibration will vary, not with the square root of its length, but with the square root of the distance from the axis of suspension of a point in the body called its center of oscillation.

If each part of the vibrating body were separately connected with the axis of suspension by a fine thread, and entirely disconnected from the rest of the body, it would form an independent simple pendulum, and oscillate as such—the time of each vibration being as the square root of the length of its thread. It follows that those particles of the body which are nearest to the axis of suspension would, as simple pendulums, vibrate more rapidly than those more remote. Being connected, however, as parts of the solid body, they vibrate all in the same time. But this connection does not affect their *tendencies* to vibrate as simple pendulums, and the motion of the body which they compose is a compromise of these tendencies of its particles. Those nearest the axis are retarded by the more remote, while the more remote are urged on by the nearer. Among these particles there is always one to be found in which the accelerating and retarding effects of the rest are mutually neutralized, and which vibrates in the same time as it would if it were unconnected with the other parts of the body, and simply connected by a fine thread to the axis of suspension. The point in the body occupied by this particle is its center of oscillation. By this C. of O. the calculations respecting the vibration of a solid body are rendered as simple as those of a molecule of inconsiderable magnitude. All the properties which belong to a simple pendulum may be transferred to a vibrating body of any magnitude and figure, by considering it as equivalent to a single particle of matter vibrating at its centre of oscillation.

The determination of the position of the C. of O. of a body usually requires the aid of the calculus. It is always further from the axis of suspension than the center of gravity is, and always in the line joining the center of gravity and the point of suspension, when the body is suspended from a point. The rule for finding it in such a case is: If S be the point of suspension, and O the C. of O., $SO=\frac{\Sigma\,(md^2)}{M.Sg}$; or it is the quotient obtained by dividing the moment of inertia of the body by the product of its mass into the distance of its center of gravity from the point of suspension.

CEN'TER OF **PERCUS'SION.** The C. of P. of a body or a system of bodies revolving about a point or axis, is that point in it, which striking an immovable object, the whole mass shall not incline to either side, but rest, as it were, in equilibrio, without acting on the center or axis of suspension. If the body be moving freely, then the C. of P. is that point in it at which its whole impetus is supposed to be concentrated. In this case, if the body struck with its C. of P. an immovable obstacle, and if it were perfectly rigid and inelastic, it would come to perfect repose; whereas, if it struck the obstacle with any other point, a rotatory motion would be produced in it. When the body is moving freely, and there is no rotatory motion, the C. of P. coincides with the center of gravity. If the body be moving round a point or axis of suspension, the C. of P. coincides with the center of oscillation. The more complicated case of a body rotating round an axis within it, would require, for its explanation, analytical formulæ which cannot conveniently be translated into ordinary language. There are many positions which the axis may have in which there will be no C. of P.—i.e., there will be no direction in which an impulse could be applied without producing a shock upon the axis. One case of this sort is that of the axis being a principal axis through the center of gravity.

CEN'TER OF **PRES'SURE.** The C. of P. of any surface immersed in a fluid is the point in which the resultant of the pressures of the fluid on the several points meets the surface. When the bottom of a vessel containing fluid, or when a plane immersed in

fluid, is horizontal, a pressure on every point of it is the same, being that due to the weight of the column of fluid standing above the bottom or plane. In either case, the pressures at the different points obviously form a system of equal parallel forces, whose center will be the center of gravity of the bottom or plane, their resultant passing through this point being the sum of all their forces. But when the plane is inclined at any angle to the surface of the fluid, the pressure is not the same at all points, but is obviously greater at the lower than at the upper points, for the lower have to support taller columns of the fluid. The resultant of these forces, then, will not pass through the center of gravity of the surface, but through a point below it. This point is the C. of P., and evidently will lie below the center of gravity for all fluids in which the pressure increases with the depth. If the surface pressed upon form part of the containing vessel, and be supposed movable, it will be kept at rest by a pressure equal to the sum of the fluid pressures applied at the C. of P., and acting in the opposite direction. In the case of a vessel with a parallelogram for one side, the C. of P. is at the distance of one third of the height from the bottom. In the case of a triangular vessel whose base is at the bottom, it is one fourth of the height only.

CENTIGRADE. See THERMOMETER.

CENTIPEDE, *Scolopendra*, a genus of *myriapoda* (q.v.), having a long slender depressed body, protected by coriaceous plates, 21 pair of legs, distinct eyes, four on each side, and antennæ with 17 joints. The name is, however, popularly extended to species of nearly allied genera. Centipedes run nimbly, feed on insects, and pursue them into their lurking-places. They have not only a pair of horny jaws, like those of insects, but also another pair of organs closely connected with the mouth, and which are regarded as transformed legs, dilated and united at the base, terminated by a strong hook, and pierced beneath the extremity for the emission of a venomous fluid, which makes their bite quickly fatal to insects, and in the case of the larger species, very painful and even dangerous to the larger animals and to man. The common C. of tropical America (*S. morsitans*) is often 9 in. or a foot in length. A species found in the s. of Europe (*S. cingulata*) is nearly as large, but its bite does not seem to be equally venomous. It may seem strange that creatures of such aspect as centipedes should ever have been thought of as human food, but Humboldt, in his personal narrative, tells us that he has seen Indian children of the tribe of the Chuymas draw large centipedes out of the earth and eat them.—The most common British C. is not a true *scolopendra*, as that genus is now restricted, but is very nearly allied to it. It is known to naturalists as *lithobius forficatus*. It is very plentiful under stones, etc., in summer. Another allied genus, *geophilus*, of more numerous joints and slender form, contains some species which are occasionally phosphorescent, one of which, *G. longicornis*, yellow, with a rust-colored head, is very abundant at the roots of turnips, etc. It is supposed, however, to be rather useful than injurious, preying on the destructive larvæ of insects.

CENTLIVRE, SUSANNA, an English dramatic authoress, was the daughter of a Lincolnshire gentleman, named Freeman, b. (most probably) in Ireland, about 1670. Her early history is obscure; but such were her wit and beauty, that on her arrival in London, though a destitute orphan, and only 16 years of age, she won the heart of a nephew of sir Stephen Fox, who, however, died shortly after their marriage. Her second husband, an officer named Carrol, lost his life in a duel. Left in extreme poverty, his widow endeavored to support herself by writing for the stage, and after producing a tragedy called *The Perjured Husband* (performed first in 1700), made her appearance on the stage. She afterwards married (1706) Joseph Centlivre, principal cook to queen Anne, with whom she lived happily until the time of her death, Dec. 1, 1723. Her plays—*The Busybody* (of which the leading character, "Marplot," is highly amusing); *A Bold Stroke for a Wife* (1717); and *The Wonder* (1714)—though not distinguished by purity of style or truthfulness of portraiture, are lively in their plots, and have kept their place on the stage.

CENTO (from Gr. *kentrōn*, patchwork), a name applied to literary trivialities in the form of poems manufactured by putting together distinct verses or passages of one author, or of several authors, so as to make a new meaning. After the decay of genuine poetry among the Greeks, this worthless verse-manufacture came into vogue, as is proved by the *Homero-centones*, a patchwork of lines taken from Homer (edited by Teucher at Leipsic, 1793); but it was much more common among the Romans in the later times of the empire, when Virgil was frequently abused in this fashion, as in the *C. Nuptialis* of Ausonius (who gives rules for the composition of the C.), and especially in the *C. Virgilianus*, constructed in the 4th c. by Proba Falconia, wife of the proconsul Adelfius, and giving, in Virgil's misplaced words, an epitome of sacred history! The C. was a favorite recreation in the middle ages. In the 12th c., a monk named Metellus contrived to make a C. of spiritual hymns out of Horace and Virgil.—See *Littérature du Centon*, by M. Delepierre (1875).

CENTO, a t. of central Italy, 16 m. n.w. of Bologna, is pleasantly situated on a fertile plain near the Reno. It is celebrated as the birth-place of the famous painter, Guercino, whose house, adorned with paintings, is still preserved; and in the church of C. are many of his works. Pop. about 5,000.

CENTRAL AMERICA

Railways represented thus

0 10 20 30 40 50 75 100 150
Geographical Miles 60 One Degree

0 10 20 30 40 50 75 100 150
English Miles 69 One Degree

The level of the Caribbean Sea at Chagres is 8 ft. 6 in higher than the level of the Pacific Ocean at Panama at low-water

Longitude West from Greenwich

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CENTRAL AMERICA, in geography that portion of North America included between the isthmus of Tehuantepec and the isthmus of Darien; politically including the states or republics of Guatemala, Honduras, Nicaragua, Costa Rica, and British Honduras, or Belize. The geographical limits would take in on the n. from Mexico the states of Tehuantepec, Chiapa, Campeche, and Yucatan; and on the s. from the republic of Colombia the greater portion of the state of Panama. Further details will be found under the titles of the respective countries. Also, see AMERICA, *ante.*

CENTRAL CITY, in Gilpin co., Col., about 40 m. w. of Denver; the center of supply for a rich mining district. Pop. '80, 2626.

CENTRAL FORCES are those which cause a moving body to tend towards some point or center, called the center of force or motion. The doctrine of C. F. has for its starting-point the first law of motion—viz., that a body not acted on by any external force will remain at rest, or move uniformly in a straight line. It follows from this law that if a body in motion either changes its velocity or direction, some external force is acting upon it. The doctrine of C. F. considers the paths which bodies will describe round centers of force, and the varying velocity with which they will pass along in these paths. It investigates the law of the force round which a body describes a known curve, and solves the inverse problem, and many others, the general statement of which could convey no clear idea to the unmathematical reader. As gravity is a force which acts on all bodies from the earth's center, it affords the simplest general illustration of the action of a central force. If a stone be slung from a string, gravity deflects it from the linear path which it would otherwise pursue, and makes it describe a curved line which we know would, in vacuo, be a parabola. Again, the moon is held in her orbit round the earth by the action of gravity, which is constantly preventing her from going off in the line of the tangent to her path at any instant, which she would do, according to the first law of motion, if not deflected therefrom by any external force. To that property of matter by which it maintains its state of rest or motion, unless acted upon by other matter, has been given the name *inertia.*

We will now explain how, through the action of a central force, a body is made to describe a curved path. Suppose it to have moved for a finite time, and conceive the time divided into very small equal parts; and instead of the central force acting constantly, conceive a series of sudden impulses to be given to the body in the direction of the center, at the end of each of the equal intervals, and then observe what, on these suppositions, will happen. Let S (see Fig. 1) be the center, and let the original motion be from A, on the line AB, which does not pass through S. In the first interval, the body will move with a uniform velocity, say from A to B. In the second, if acted on by no force, it would move on in AB produced to *c*, B*c* being = AB. But when it arrives at B, it receives the first sudden impulse towards S. By the composition of velocities (q.v.), it will move now with a new but still uniform velocity in BC instead of B*c*, BC being the diagonal of the parallelogram of which the sides represent its impressed and original velocity. Having reached C at the end of the second interval, it receives the second impulse towards S. It will now move in CD instead of in BC produced. If, then, we suppose the periods of time to be indefinitely diminished in length, and increased in number, the broken line ABCD will become ultimately a continuous curve and the series of impulses a continuous force. This completes the explanation.

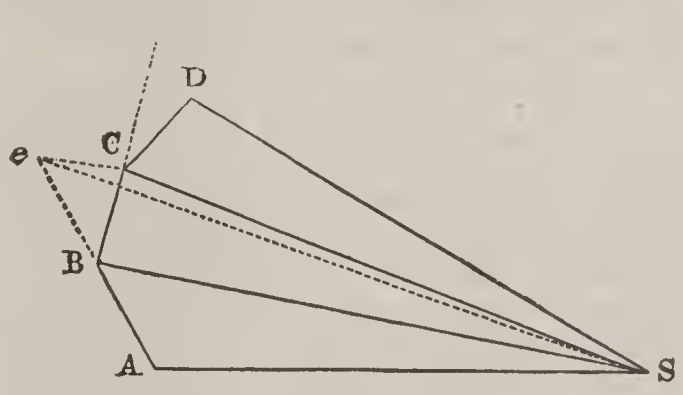


Fig. 1.

Going back, however, on our suppositions, we may here establish Newton's leading law of central forces. That the body must always move in the same plane, results from the absence of any force to remove it from the plane in which at any time it may be moving. The triangles ASB and BSC are clearly in the same plane, as the latter is on that in which lie the lines B*c* and BS. Also, since the triangles ASB, BS*c* are equal, being on equal bases, AB, B*c*, and triangle BSC = triangle BS*c*, as they are between the same parallels, *c*C and BS, it follows (by Euclid I. 37) that ASB = BSC. So BSC = CSD; and so on. In other words, the areas, described in equal times by the line (called the radius vector) joining the center of force and the body, are equal. As this is true in the limit, we arrive, by the composition of the small equal areas, at the law: that the areas described by the lines drawn from the moving body to the fixed center of force, are all in one plane, and proportional to the times of describing them. Very few of the laws of C. F. are capable of being proved like the preceding, without drawing largely on Newton's lemmas, with which we shall not suppose the reader to be acquainted.

Centrifugal and Centripetal Force.—We have shown that a body continually drawn to a center, if it has an original motion in a line that does not pass through the center, will describe a curve. At each point in the curve, it tends, through its inertia, to

recede from the curve, and proceed in the tangent to it at that point. It always *tends* to move in a straight line in the direction in which it may at any time be moving, and that line, by the definitions of a tangent and of curvature, is the tangent to the curve at the point. At the point A (see fig. 2), it will endeavor to proceed in AD: if nothing hindered it, it would actually proceed in that line, so as, in the time in which it describes the arc of the curve AE, to reach the point D, and thus recede the length DE from the curve; but being continually drawn out of its direction into a curve by a force to a center, it falls below the point D by the distance DE. The force which draws it through this distance is called the centripetal force, and that which would make it recede in the same time through the distance DE from the curve is called the centrifugal force. It may be remarked that the centrifugal force is not, like the centripetal, an impressed or external force acting on the body. It is simply the assertion of the body's inertia under the circumstances produced by the centripetal force.

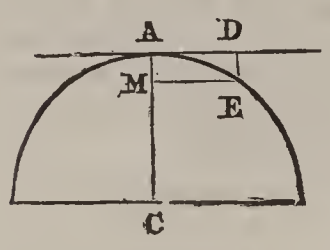


Fig. 2.

Many familiar illustrations will occur to the reader of the action of what is called the centrifugal force. A ball fastened to the end of a string, and whirled round, will, if the motion is made sufficiently rapid, at last break the string, and fly off. A glass of water may be whirled so rapidly that, even when the mouth is pressed downwards, the water will still be retained in it, by the centrifugal force pressing it up against the bottom of the glass. The centrifugal action will be found to increase with the velocity. In all cases of a body moving in a circle, the force, it can be proved, varies as the square of the velocity of the body at the moment, and in the inverse ratio of the radius. As in this case the velocity varies as the radius inversely, it follows that the force is as the inverse cube of the radius. As in the case of circular motion the body always is at the same distance from the center, it follows that the centrifugal and centripetal forces are equal at all points of a circular orbit. The general law for all orbits is, that the centrifugal force varies as the inverse cube of the distance from the center. As the attractive force of gravitation varies as the inverse square of the distance, it may hence be shown that the centrifugal force gives perfect security, notwithstanding the constant attraction of the sun, that the planets, so far as that attraction is concerned, will never fall into the sun.

The doctrine of C. F. owes more to Kepler and sir Isaac Newton, of whose philosophy it makes a considerable branch, than to all the rest of the philosophers, though almost all the leading mathematicians have contributed to it. The doctrine of centrifugal forces was first mentioned by Huygens, at the end of his *Horologium Oscillatorium*, published in 1673; but Newton was the first who fully handled the doctrine, at least so far as regards the conic sections.

CENTRAL HEAT involves the theory that the temperature of the earth increases from its surface towards its center. Observations in mines and in boring artesian wells seem to justify such a conclusion, and the inference therefore is that the solid earth is a mere crust, at most but a few miles thick, within which all matter must be in a state of fusion. Observers have estimated the increase of heat at 1° F. for 50 to 60 ft. of depth. Eminent philosophers, however, reject the theory, and attribute the phenomena to local heat. They argue that if such a mass of fire existed in the interior the crust would soon be melted. Some contend that if the earth ever cooled from a state of fire to its solid form, the cooling must have commenced in the center. The most that can be said is that it is still an open question, while experiments and indications seem to favor the theory of a fiery and fluid interior.

CENTRALIA, a city in Marion co., Ill., on the Illinois Central railroad, at a junction of the Chicago branch with the main line, 112 m. n. of Cairo. There are repair shops of the Illinois Central railroad, which give employment to many persons. Pop. '80, 3,621.

CENTRAL INDIA POLITICAL AGENCY, the official name for a group of feudatory states in the middle of India, the principal of which are Gwaliar (Scindiah), Indor (Holkar), Rewah, and Bhopal. The total number, great and small, comprised in the C. I. P. A. is 71; covering about 90,000 sq.m., and having a pop. of 8,000,000. These states have nothing in common except a diplomatic connection with the British government through the agent to the governor-general.

CENTRALIZATION, a term which has lately come into general use for expressing a tendency to administer, by the sovereign or the central government, matters which had been previously under local management. We cannot properly use the term towards an established despotism, for there everything is already directed from the center. The legitimate application is to a state of change from local to central management—a change in the opposite direction would, on the same principle, be called localization. Of this latter change, however, it can scarcely be said that we have any recent example, unless it may be found in the systems of self-government lately communicated to some of the British colonies. Ever since the existing European states began to grow out of

the chaos of the fall of the Roman empire, there has been a continued progress in centralization. That empire itself was, however, the greatest instance of C. which the world has yet seen. In it the numerous municipalities and other local organizations originally existing in Italy, and communicated to the colonies, were entirely centralized. The empire, such as it had been in the days of Constantine, was the type after which the European monarchs, such of them especially as became more powerful than their neighbors, were ever striving; and a few of them, such as Charlemagne, and, long afterwards, Charles V., seemed to have almost restored it. In this country, we trace C. from the time when there were about a dozen kings in Britain, and perhaps as many in Ireland, till the united kingdom came under the rule of one monarch. A subsidiary C. at the same time made silent progress, absorbing the feudal power of the aristocracy and the municipal privileges of the corporations. In other countries—as, for instance, in France, notwithstanding her desperate struggles for freedom, this process of C. has tended to a pure irresponsible despotism. With so sad a result before their eyes, a distrust of C. has not unnaturally been felt by some inhabitants of Great Britain. But the British constitution possesses a grand remedy, which turns the process to good use instead of mischief. While administrative authority has been centralizing in the crown, the controlling power of parliament has been increasing at a more rapid ratio, so that the vesting of a function in the crown or central government, means the putting it under the control of parliament, and especially of the people's representatives in the house of commons. There is nothing done in any of the offices under the government for which a secretary of state, or some other member of the ministry, may not at any time be called to account in parliament. The efficiency of this control was in a manner proved by one or two instances in which offices with central powers were created, without being connected with any of the great state departments. There were, for instance, the English poor-law board, and the board of health. Both created much discontent and outcry about C., and it was found necessary to transfer their functions to the great government departments, the heads of which are immediately responsible to parliament. It is not the policy of this country in any case to abolish local management, but rather to aid and direct it from the central authority. The constituents of local bodies are often disinclined to watch or control them, and the business falls into the hands of incapable or designing men, or is otherwise mismanaged. A very little central help—especially from a quarter where the proceedings of other bodies of the same kind are known—remedies such defects. One of the methods in which the government has of late been in use to exercise its central power, has been been by the appointment of inspectors, who make reports which are laid before parliament. This is, in reality, nothing more than a method of concentrating public opinion on the proceedings inspected and reported on, and as such it is very efficacious.

CENTRAL PARK. See New York City.

CENTRAL PROVINCES, a chief commissionership of British India, between 17° 50′ and 24° 30′ n., and 76° and 85° e.; 80,078 sq.m.; pop. '81, 8,173,824. The chief-commissionership was constituted in 1861, when the territories previously known as the Nagpur province and the Sagar and Nerbudda territories were united under the name of the Central provinces. This tract comprising almost every variety of soil and physical aspect, inhabited by races of very diverse origin, is bounded n. by the feudatory state of Rewah, the small native states of Bundelkhand, and by the district of Latatpur in the Northwest Provinces; on the n. and e. by the Chhota Nagpur division, the Oressa tributary states, and the n. districts of Madras; on the s. by the Godavari district; and on the s.w. and n.w. by the states comprising the Central India Political Agency. The Central Provinces are separated into four divisions, or commissionerships: Nagpur, Jabalpur, Nerbudda, and Chhatisgarh, comprising 19 British districts. The country is intersected by the Great Indian Peninsular and the East Indian railroads. The pop. is made up in each thousand, of 717 Hindus, 28 Mohammedans, 4 Buddhists, 2 Christians, and 249 "others," who consist of descendants of Gonds and original inhabitants.

CENTRIFUGAL and **CENTRIPETAL** are terms used in botany to designate two different kinds of inflorescence, or modes of flowering of plants. When the flower-bud which terminates the floral axis, and is central in the inflorescence, is the first to expand —in which case the others are developed in succession from the center outwards—the inflorescence is said to be *centrifugal.* When the outermost flowers expand first, the inflorescence is *centripetal,* as is the case in catkins, spikes, and racemes, in which the flowers nearest the base are the first to expand, and those nearest the apex the last. These modes of inflorescence are very characteristtic of different plants, of genera, and of orders.

CENTRIFUGAL FORCE. See Central Forces.

CENTRIPETAL FORCE. See Central Forces.

CENTUM'VIRI, judges among the Romans appointed to decide common causes among the people. Three were chosen in each tribe. The extent of their jurisdiction is not clearly understood, but it was probably confined to unimportant causes.

CENTURION, a Roman infantry officer who originally commanded a hundred men, but afterwards an indefinite number. They were of two grades, and were chosen by the tribunes. Their duties were to drill the soldiers and appoint them tasks; and they had power to punish for minor offenses.

CENTURY PLANT. See AGAVE, *ante.*

CEPHAË'LIS. See IPECACUANHA.

CEPHALAS'PIS, a genus of fossil ganoid fishes, of which six species have been described, two belonging to the upper Silurian and four to the Devonian measures. The head was protected by a large ganoid plate, sculptured externally with circular radiating markings. Agassiz gave the name C. (buckler-headed) from this extraordinary covering, which has very much the appearance of, and was formerly supposed to be, the cephalic shield of an *asaphus.* The body was covered with rhomboidal enameled scales, and furnished with dorsal and pectoral fins: it terminated in a large heterocercal tail. In a graphic description of this fossil in his *Old Red Sandstone,* Miller thus sketches the general appearance of the animal: "Has the reader ever seen a saddler's cutting-knife—a tool with a crescent-shaped blade, and the handle fixed transversely in the center of its concave side? In general outline, the C. resembled this tool, the crescent-shaped blade representing the head, the transverse handle the body." The endo-skeleton was cartilaginous, retaining the notochord through life. The flexible body, assisted by the large tail and the fins, would give the C. the power of moving rapidly through the water. Being a predaceous fish, it must have been a formidable enemy to its associates in the palæozoic seas, for, besides its power of rapid motion, the sharp margin of its shield probably did the work of a vigorously hurled javelin, as in the sword-fish. This genus was originally named *asterolepis* (star-scale), from the circular marking on its cephalic shield.

CEPHALIZA'TION, a word used to indicate the degree in which the head, or, more accurately, the brain, dominates over the remainder of the animal structure. The distinction between a higher and a lower cephalization may be indicated thus:

SUPERIOR CEPHALIZATION.	INFERIOR CEPHALIZATION.
More of the anterior appendages serve the head, in supplying food, etc.	Fewer of the anterior appendages serve the head.
The structure of the head is compacted, and its form abbreviated.	The structure of the head is loose and imperfect; the form is elongated and enlarged.
The posterior part of the body is abbreviated and compacted.	Great length of tail shows inferiority of grade.
The anterior extremity tends upward; finds its limit in man, and is erect.	The anterior extremity tends downward, finds its limit and is horizontal in the fish.

Degradation often extends to the absence of essential parts, as teeth, limbs, senses, and is often indicated by gross enlargement of mass, accompanied by stupidity and sluggishness.

Degrees of cephalization may be illustrated by the subdivisions of the mammalia beginning with the lowest: 1. The mutilates, in which the limbs are wanting, or are degraded to fins; as whales, dolphins, etc.: 2. Herbivores, or plant-eaters; as the elephant, horse, deer, hog, etc.: 3. Carnivores, or flesh-eaters; as the lion, bear, dog, wolf, etc.: 4. Quadrumanes, including monkeys: 5. Bimanes, including mankind. Following this arrangement, as we ascend step by step, we find constant degrees of development corresponding to higher cephalic character, and showing itself in every phase of organized structure. In locomotion, for example, we find the limbs of (1) the mutilates fit only for paddling the body about in the element which gives it support; those of (2) the herbivores carry them from place to place; those of (3) the carnivores carry them about, and serve to grasp and tear their prey; those of (4) the quadrumanes serve for locomotion, for grasping prey, for carrying food to the mouth, and for carrying and defending their young; while in (5) man the fore limbs are relieved from service of locomotion, and are fitted not merely for feeding, for carrying, for defense, but also for an infinity of purposes, to which they are guided by the acuter sensibility of the brain. Similar steps of gradation may be found in other respects, as in the tail, the teeth, the form of the skull, etc. The principle may be further illustrated by the gradations of the lower orders, as in the articulates, going from the worms through the crustaceans to the insects; or in insects, from myriapods through spiders to the true insects; as in the varieties of man, in which the lower races have projecting jaws, retreating foreheads, and enlarged basal brains. With increased brain-force we find diminished jaw, less facial angle, elevated and enlarged forehead, the head generally shortened from front to rear, a larger cavity for the brain, and a greater weight thereof. Finding this constant progression from lower to higher developments, whose exponent is larger and more efficient brain, with nicer adaptation of mechanism for all the functions of life; finding also evidence of a similar gradation in sensation, sensibility, intelligence—everywhere the material more and more subordinated to the immaterial, the body conformed to the spirit, and ruled by it—it is not strange that men should look for a law of development, pervading and controlling all animated nature, or that they should expect to find in this law a formula of the relation between thought and matter, as a function of

the brain. But, while there may be abundant reason for supposing that such a law of relationship might exist, and that if demonstrated it might account logically for a vast and rapidly growing mass of observed facts, it is evident that no such law has yet been proved. Nor, indeed, does it now seem that such a law can be demonstrated without the admission of axioms and postulates, which involve as great strains upon the philosophic imagination as the very principles which such demonstrated law would antagonize and overthrow.

CEPHALO'NIA, or CEFALONIA, the largest of the seven Ionian islands (q.v.), is situated at the entrance of the gulf of Lepanto or Corinth, in lat. 38° 3′ to 38° 30′ n., and long. 20° 21′ to 20° 49′ east. It is irregular in shape. Its greatest length is about 30 m., and its total area 348 sq. miles. Its surface is mountainous, the soil, for the most part thin, and water very scarce. The inhabitants, however, are industrious and enterprising, and have planted vineyards wherever the grape will grow, and currants and olive-oil are also produced for export. The climate is warm and agreeable. The population in 1870 amounted to 77,382. The numbers who are brought up to the medical profession are remarkable; it is said that there is hardly a town in the Levant which has not a practitioner from Cephalonia. The inhabitants are also much more disposed to engage in foreign trade than those of Corfu or Zante, and own more vessels. In 1874, the exports amounted to £189,309, and the imports to £240,410. The island is subject to frequent, but slight earthquakes. There was formerly a small English garrison at Cephalonia. Steamers ply between it and Malta, Patras, and Triest. The language spoken is a Greek dialect. The chief towns are Argostoli (q.v.) and Lixuri.

C. is called by Homer Same or Samos, and during the heroic ages was subject to Ulysses, whose residence was in the neighboring isle of Ithaca (q.v.). Later, C. appears under the name of Cephallenia. It successively fell into the hands of the Athenians, Romans, Byzantines, and Venetians, from the last of whom it was several times wrested by the Turks. On the ruin of the Venetian republic in 1797, it was seized by the French, who were in their turn dislodged by the Russians. In 1809, it came into the possession of England. It was ceded to Greece in 1864.

CEPHALOP'ODA (Gr. head-footed), a class of mollusks, the highest in organization of that division of the animal kingdom. To this class belong the nautili, spirulæ, argonauts, poulpes, squids or calamaries, cuttle-fish, etc., of the present time, and the ammonites, belemnites, etc., of former geological periods. The C. are all marine, and only a few of them are capable of leaving the water, and moving about in search of food on shore.

The C. receive their name from having organs of prehension and locomotion attached to the head, an arrangement towards which a gradual approach may be traced in the highest gasteropod (q.v.) mollusks. These organs have been variously designated *arms, feet,* and *tentacula.* They "have no true homology" with the limbs of vertebrate animals, but are only analogous to them in respect of the purposes which they serve.—The body of the C. is a bag, formed of the *mantle* (see MOLLUSCA), open only at the end to which the head is attached. In some, this bag is almost spherical, and locomotion is accomplished only by the appendages of the head; in others, the body is elongated, and furnished with two fin-like expansions, which are the principal instruments of locomotion. In locomotion by the fins, a cephalopod swims like a fish, with the head first, and often very rapidly; in locomotion by the arms, it draws itself along, laying hold of any object within reach by means of suckers, with which the arms are furnished. Some C. are capable also of moving backwards through the water by alternate contractions and expansions of a muscular web which unites the bases of the arms; some appear to depend for a similar power of swimming backwards upon the forcible ejection of water from the 'funnel" below the eye.

The head of a cephalopod is roundish, generally furnished with two large and prominent eyes, very similar in structure to those of vertebrate animals. There are also ears, but they consist merely of little cavities, one on each side of the brain, in each of which is suspended a membranous sac containing a small stone. The organs of smell are not very certainly known, but it appears that the C. possess this sense, as well as that of taste, of which the character of the tongue is much more indicative than in many vertebrate animals.—The brain forms a ring around the gullet. The whole nervous system is more complex than in the lower mollusks.—The mouth opens in the midst of the circle of arms. It is furnished with a strong horny beak of two mandibles, moving vertically, not unlike the bill of a parrot, but the upper mandible the shorter of the two. —The digestive apparatus is very complicated. The gullet swells out into a crop, and there is a gizzard as muscular as that of a bird. The intestine, after a few convolutions, terminates in the cavity which contains the gills, at the base of the funnel by which the water is ejected after having supplied air for respiration. This cavity is situated within the mantle or bag, and separated from the other viscera by a membranous partition. Into it the water is freely admitted by means of a slit or valvular opening, being drawn in by muscular action, and again expelled with considerable force through the funnel, which opens at the neck, and with its current all secretions, eggs, and excrements are carried forth. There are only two gills in the greater number of existing C., the only exceptions being the two or three known species of *nautilus,* which have four gills; and

two-gilled C.—the order *dibranchiata*—are in many respects of higher organization than the four-gilled—the order *tetrabranchiata*—which, although containing so few recent, contains a vast number of fossil species. Each gill consists of many membranous plates, fixed to two sides of a stalk.—The heart in the *tetrabranchiata* consists of a single ventricle only; but besides this *systemic* heart, the *dibranchiata* have two *branchial* or *respiratory* hearts, contractile reservoirs, one for each gill, by which the blood is forced into these organs.

The "arms" or "feet" are very numerous in the *tetrabranchiata*, not provided with suckers, but hollow, and with long retractile tentacula; in the *dibranchiata* they are only eight or ten in number, furnished with suckers (*acetabula*); two of them, when they are ten in number, being much longer than the rest, and differing from them in form. The suckers are very admirably constructed—an adhesive disk of muscular membrane, often having a cartilaginous circlet, capable of most exact application to any object, with an aperture in the center leading into a cavity, the bottom of which can be retracted like a piston so as to form a vacuum, and render the adhesion of the sucker close and firm, whilst on the muscular action being interrupted or reversed, it immediately lets go its hold. The poulpe has each of its eight flexible arms crowded with 120 pairs of such suckers, and as an animal of this kind exists on some tropical shores, with arms about 2 ft. long, it is not wonderful that it is reckoned dangerous. Still more formidable, however, are the hook-squids of the South seas, the two long arms of which have suckers furnished in the center with a hook to enter into the flesh of any creature of which they may lay hold, and so more effectually to secure their prey.

The sexes are distinct in all the cephalopoda. The eggs have a horny covering, and after their extrusion from the parent, become agglutinated into masses of various forms. The young, from the first, very much resemble the mature animals, except in size.

All the *dibranchiata* are provided with a peculiar organ of defense, called an "ink-bag," which is wanting in the *tetrabranchiata*. This ink-bag is filled with a peculiar secretion, capable of being expelled at will to darken the water, and facilitate the escape of the cephalopod.

The tetrabranchiate C. have a chambered shell. See NAUTILUS. The dibranchiate C. have no external shell—the shell of the female argonaut (q.v.) being scarcely an exception—but they have an internal shell (cuttle-fish bone, etc.), sometimes merely rudimentary, included between two folds of the mantle, and apparently intended to give support to the soft body of the animal.

The C. are all very voracious, feeding on fish, mollusks, crustaceans, etc. Even a powerful crab is not safe from the attacks of a dibranchiate C. little bigger than itself; the arms, so abundantly provided with suckers, seize it, and trammel every movement, whilst the parrot-like beak is strong enough to break the hard shell. Cuttle-fish and squids are often very troublesome to fishermen, following shoals of fish, and devouring great numbers of them after they are entangled in the net.

Fossil C. exist in all the strata which form the earth's crust. The order *tetrabranchiata* is almost exclusively a fossil order, being represented by not more than four recent species. With the exception of two genera, *nautilus* and *aturia*, this order is confined to primary and secondary rocks. The two groups into which it is divided are also characteristic of geological epochs. The *nautilidæ*, with simple or gently undulating septa, and siphuncle central or in the inner margin, belong, with the exception of the two genera just referred to, to the paleozoic rocks. Including a small group which, while it has the siphon on the external margin, has yet simple septa, the *nautilidæ* are represented by 145 Silurian, 158 Devonian, and 91 carboniferous species. The *ammonitidæ* have the siphuncle always on the outer margin of the shell, and the septa with corrugated or lobed margins. This group, with the exception of *goniatites*, a paleozoic genus, is peculiar to, and co-extensive with, the secondary strata. Of the 930 species that have been described, more than the half belong to the genus *ammonites* (q.v.).

The order *dibranchiata* is found first in the lias, and extends through the more recent strata, receiving its full development in our present seas. Scarcely 90 fossil species have been described, while more than double that number are known as recent animals. See AMMONITES, ARGONAUT, BELEMNITES, CALAMARY, CERATITES, CUTTLE-FISH, GONIATITES, HOOK-SQUID, NAUTILUS, OCTOPODA, ORTHOCERAS, POULPE, etc.

CEPHALOP'TERA (Gr. head-wing), a genus of cartilaginous fishes of the ray family, the type of a sub-family, *cephalopteridæ*. The pectoral fins are very much elongated, so as to give great breadth to the fish. The tail is slender and without fin, but armed near its origin with a great spine. The head is terminated in front by a straight line, and on each side of it there projects a membrane (*precephalic fin*) rolled upon itself, and resembling in shape a pointed horn. The name HORNED RAY has therefore sometimes been given to these creatures, of which only one species, *C. giorna*, has ever been found on the British coasts. It is not uncommon in the Mediterranean, and there acquires a great size; one is mentioned as having been taken off Messina, which weighed 1250 lbs.—more than half a ton. But this is small in comparison with the size of some of the *cephalopteridæ* which occur in tropical seas: one taken at Barbadoes required seven yoke of oxen to draw it. They are very dangerous to swimmers and bathers.

CEPH'EUS, a constellation of the northern hemisphere, containing, according to the Britannic catalogue, 35 stars. Its principal star is Alderamin, of the third magnitude.

CEPO'LA. See BANDFISH.

CERAC'CHI, GIUSEPPE, 1760–1801; a native of Corsica who was active in establishing a republic in that island in 1798. He took refuge in France, and with others undertook the assassination of Napoleon. The deed was to have been done while the consul was at the opera, Oct. 10, 1800, but there was a traitor among the conspirators, and C. and three others were seized, tried, and executed. C. was a sculptor of some note.

CERAM', an island in the Moluccas archipelago, lies n.e. of Amboyna, between 2° 44′ 30″ and 3° 30′ 30″ s. lat., and 129° 30′ and 130° 53′ e. long., and is divided into Great and Little Ceram by the isthmus of Tarúno. Area, 7,140 sq.miles. Pop. 195,000. Malays inhabit the coasts; Papuans the interior. A mountain chain runs through C., reaching in Núsa Keli 9,250 feet. The soil is very fertile. The vegetable products include timber-trees, rice, sago, maize, sugar-cane, bananas, and edible roots. The Malays fish. Exports are Ceram clothing, textiles, iron, copper-wire, earthenware, birds of paradise, trepang, sago, dried fish, edible nests, etc. C. belongs to the Netherlands.

CERAM'BYX, a Linnæan genus of coleopterous insects, included among those which, on account of the length of their antennæ, are usually known as LONG-HORNED BEETLES, and now generally regarded as the type of a tribe or family. To this tribe belongs the musk beetle of England (*callichroma moschata*), remarkable for its strong and agreeable odor, which, however, is rather that of roses than of musk. Some foreign species have the odor of musk in great perfection. *C. heros*, one of the largest European beetles, extremely rare in Britain, deposits its eggs in a hole which it excavates for that purpose in the wood of the oak; and the grub feeds upon the wood, excavating long passages through it.

CERAMIA'CEÆ, a sub-order of *algæ* (q.v.), also called FLORIDEÆ, and consisting of sea-weeds of a rose or purplish color, with fronds formed of cells arranged in rows, sometimes in a single row; the *sporocarps* containing cells or *spores*, often in fours (*tetraspores*), with a transparent *perispore*, and inclosed in receptacles of very various form and structure. They are most abundant in the seas of the northern temperate zone. Many of them are very delicate and beautiful. A considerable number furnish agreeable articles of food of a gelatinous nature, as dulse (q.v.), carrageen (q.v.) or Irish moss, and certain species of plocaria (q.v.), which are much used on the sea-coasts of the East Indies. The edible swallows' nests of the east are supposed to be formed of a sea-weed of this sub-order, a species of *gelidium*.

CERAM'IC (Gr. *keramos*, potter's clay, from *kaio*, to burn, and *era*, earth), a term used to designate the department of plastic art which comprises all objects made of clay, such as vases, cups, bassi-rilievi, cornices, and the like.

CERAMI'CUS, a public ground, or potter's field, outside of the walls of Athens, where citizens killed in war were buried at the expense of the state.

CERAS'TES, or HORNED VIPER, a genus of serpents of the family *viperidæ*, distinguished by a broad depressed heart-shaped head, the scales of which are similar to those of the back, and particularly remarkable for the development of one of the scales of each eyelid into a spine or horn, often of considerable length. The tail is very distinct from the body, This genus is exclusively African, and very venomous. The best known species, *C. vulgaris*, the horned viper of the n. of Africa, was called C. by the ancients, the name being derived from the Greek *keras*, a horn. It was correctly described by the traveler Bruce, but his description was for some time regarded with incredulity. Other species of the same genus are *C. nasicornis* of the western coast of Africa, and *C. caudalis* of the cape of Good Hope.

CE'RATE (Lat. *cera*, wax), a compound of wax with other oily and medicinal substances in such proportions as to have the consistence of an ointment (q.v.). Simple C. is made by melting together equal parts of white wax and olive-oil; they are to be heated together, and carefully stirred into a uniform substance, while cooling.

CE'RATITES, a genus of ammonitidæ, peculiar to, and characteristic of, the trias. They are distinguished from the other members of the family by having the lobes of the sutures serrated, while the intervening curves, directed towards the aperture, are simple. Twenty-six species have been described.

CERAUNIAN MOUNTAINS, a name given by the Greeks to two mountain chains, the first being probably the e. extremity of Caucasus; according to Strabo that portion of the Caucasus which looks down upon the Caspian sea, where he locates the land of the Amazons. The second, called also "Acroceraunian," extended along the coast of the Ionian sea. These mountains were often mentioned in ancient poetry. The chain is now called Khimara, Chimara, or Chinari.

CERBERUS (Gr. *kerberos*), in Greek mythology, was the name of the many-headed dog—the offspring (according to Hesiod) of Typhon and Echidna—who guarded the portal of the infernal regions. Later writers describe C. as only three-headed, with the tail and mane composed of serpents, though the poets sometimes encumber him with

100 heads.—A northern constellation, near the hand of Hercules, was named C. by Hevelius.

CERCA'RIA, a name formerly given to a supposed genus of *entozoa,* at first, from their minute size, mistaken for *infusoria,* but now known to be the young of *trematode worms.* In the form to which the name C. was given, these creatures consist of an oval body with a thread-like tail; and swim about with great activity in water, but exhibit a strong instinctive propensity to penetrate into the soft bodies of insect larvæ, which they do by means of a spine-like weapon projecting from their head. The tail, as no longer needed, is now left behind, the closing of the wound through which the C. enters apparently nipping it off. Within the body which it enters, the C. loses also its spine, becomes encysted, and awaits its passive migration into an animal of higher kind, there to become a trematode worm. When it does not succeed in finding, in due time, a larva into which to enter, the C. gathers itself up into a ball; emits a mucous secretion, which soon hardens; and incessantly turning round within this mucous mass, becomes invested with a sort of shell, in which form it is not unlikely to be swallowed by some vertebrate animal. The C. is not the immediate offspring of a parent like itself. It is generated in a curious little animated sac, which is to be found buried among the organs of fresh-water mullusks, and within which this development of young takes place by gemmation. See GENERATIONS, ALTERNATION OF.

CERCELÉE, or RECERCELÉE, in heraldry, is a cross circling, or curling at the ends, like a ram's horn.

CER'CIS. See JUDAS'S TREE.

CERCOCE'BUS (Gr. tail-ape), a genus of monkeys, natives of Asia and Africa, included by some naturalists in the large genus *cercopithecus.* These monkeys have large cheek-pouches, large callosities, and long tails. The species commonly called MANGABEYS, or WHITE EYELID MONKEYS, are commonly referred to this genus, besides the CALLITHRIX, or GREEN MONKEY, and the MALBROUK, or DOG-TAILED BABOON.

CERCOPITHE'CUS (Gr. tail-ape), a genus of monkeys, containing a large number of species, natives of Asia and Africa, but chiefly of Africa. They are called *guenons* by French naturalists, but they have no common English name more distinctive than monkey. They have cheek-pouches and callosities, and a long but not prehensile tail. A MONA, or VARIED MONKEY (*C. mona*)—an African species—in the Parisian menagerie, was remarkable not only for the cunning and adroitness with which it searched and rifled the pockets of visitors, but also for the readiness with which it applied a key to the opening of a lock, untied knots, undid the rings of a chain, and performed other similar feats.

CERDO'CYON (Gr. cunning-dog), a genus of *canidæ,* apparently intermediate between true dogs and foxes, natives of South America. They are sometimes called Aguara foxes. Their aspect is thoroughly vulpine, as are also their manners. Some of them add to the dispositions of ordinary foxes a singular propensity to steal and secrete brilliant or gaudy objects. A Brazilian species has been known to carry pocket-handkerchiefs into the woods. Some are natives of the coldest parts of South America, and have a rich fur.

CERDONIANS, a sect of Gnostics, founded by Cerdo, a Syrian, who came to Rome about 140 A.D. They held that there were two primal causes—the perfectly good, and the perfectly evil. The good created the world, is the God of the Jews, and the author of the Old Testament. Jesus Christ is the son of the good Deity: he was sent into the world to oppose evil; but his incarnation, and consequently his sufferings, were mere appearance. Deeming the human body the work of the evil deity, the Cerdonians prohibited marriage, wine, and flesh-eating, and advocated fasting and other austerities. Cerdo rejected the Old Testament, and all of the New, except a part of Luke's gospel and Paul's epistles.

CERE. See BILL.

CERE'A, a t. of n. Italy, about 19 m. s.s.e. of Verona. It is a straggling place, with the remains of an old castle. Pop. 5,930. The Austrians defeated the French here in 1798.

CEREA'LIA, or CE'RËAL GRASSES, so named from Ceres (q.v.), are the plants which produce grain or corn; in other words, all the species of grass (*gramineæ*) cultivated for the sake of their seed as an article of food. They are also called corn-plants or bread-plants. They do not belong to any particular tribes of the great order of grasses, but differ from each other botanically, perhaps as much as any plants within the limits of that order. The seeds of the grasses in general being indeed farinaceous and wholesome, the employment of particular species as bread-plants seems to have been determined chiefly by the superior size of the seed, or by the facility of procuring it in sufficient quantity, and of freeing it from its unedible envelopes. Some of the grains, as wheat and barley, are produced in ears or close-set spikes; some, as a few of those called millet, in spike-like panicles; others, as oats and rice, in very loose panicles. The form and size of the grains vary not a little, some being roundish, and some elongated; maize is the largest; many of the millets are very small. The plants themselves vary in size

almost as much as their seeds, the millets being the smallest, and maize the largest of ordinary corn-plants.—Buckwheat and spurry are sometimes ranked with the C., but incorrectly, if the term is regarded as having any botanical limits, for they are not grasses; but their seeds are used in the same way. The quinoa of South America, and the kiery (*amaranthus*) of India, with other plants of different orders, might be added to the list on the same account; even the lotus of the Nile, the *Victoria regia*, and other species of water-lilies might thus be reckoned as cereal plants. The most extensively cultivated grains are wheat (*triticum*), barley (*hordeum*), rye (*secale*), oats (*avena*), rice (*oryza*), maize or Indian corn (*zea*), different kinds of millet (*setaria*, *panicum*, *paspalum*, *pennisetum*, and *penicillaria*), and durra or Guinea corn (*sorghum* or *andropogon*). These have all been cultivated from time immemorial, and there is great uncertainty as to the number of species to which the many existing varieties belong; their original forms and native countries cannot confidently be determined. Barley, oats, and rye are the grains of the coldest regions, the cultivation of the two former extending even within the arctic circle. Wheat is next to these, and in the warmer regions of the temperate zone its cultivation is associated with that of maize and rice, which are extensively cultivated within the tropics. The millets belong to warm climates, and durra is tropical or sub-tropical. Rice is the food of a greater number of the human race than any other kind of grain. Maize has the greatest range of temperature.—Besides these, other grasses are cultivated to some extent, in different parts of the world, for the grain they yield: a species of *eleusine* (mand) in India, and another (tocusso) in Abyssinia; a species of *poa* (teff) in Abyssinia, and a species of *coix* (Job's tears) in India. Canary grass (*phalaris*) may also be named. Canadian rice (*zizania*) is used as a grain, but is scarcely cultivated, and the same remark applies to the manna grass (*glyceria*) of the n. of Europe, to some species of bamboo (*bambusa*), and to the sea lyme grass (*elymus*), which affords an esteemed article of food, in small quantity, to the inhabitants of Iceland.

Of all the C., wheat is by common consent admitted to be that of which the grain is best fitted for the making of bread, although others are to some extent employed for this purpose. But some, as rice and maize, are scarcely suited for it, and other methods are chiefly employed of preparing them for food. All the grains are also used to produce some kind of fermented liquor or beer, and spirituous liquors are obtained from them by distillation.

CEREBELLUM. See Cerebrum.

CEREBRINE, or Cerebric Acid, is an organic acid of very complex composition, found in the liver, blood, and nerves, but especially the brain of animals.

CEREBRO-SPINAL FLUID. There is an interval, termed the *sub-arachnoid space*, lying between the two innermost of the membranes of the brain and spinal cord—viz., the arachnoid and the pia mater. This space, which is narrow on the surface of the cerebral hemispheres, but is comparatively wide at the base of the brain between the two middle lobes of the cerebrum, and, posteriorly, between the hemispheres of the cerebellum and the medulla oblongata, is occupied by the cerebro-spinal fluid, which fills up the interval between the arachnoid and pia mater, and keeps the opposed surfaces of the former membrane (which is a closed serous sac) in contact. The cerebro-spinal fluid is a clear, limpid, slightly albuminous fluid, having a saltish taste, and a faintly alkaline reaction, and not containing more than 1.5 per cent of solid matters. It varies in quantity from 2 to 10 ozs., and is said to be most abundant in aged persons. Its chief use is to afford mechanical protection to the nervous centers, and to prevent the effects of external shocks or concussions.

CER'EBRO-SPINAL MENINGITIS. See Meningitis, *ante*.

CEREBRUM–CEREBELLUM. Cerebrum (Lat. the brain) is sometimes applied to the whole contents of the cranium or skull; but more usually it denotes the upper portion, while the under and posterior portion is called the Cerebellum, or little brain. In this article we shall briefly notice the chief results which have as yet been obtained regarding the uses of the various parts of the mass, referring to the article Brain for the necessary anatomical details.

The *crura cerebri* appear as the principal conductors of impressions to and from the cerebrum. When one is divided, the animal moves round and round, from the injured towards the sound side, as if from a partial paralysis of the latter side. The effect may be referred to the interruption of the voluntary impulses from the C., for although the cerebellum seems to have the office of combining the muscles, whose co-operation is necessary for each action, the effort of the will must proceed from the cerebrum.

The *corpora quadrigemina* are, as stated in the article Brain, "analogues of the optic ganglia of the lower animals." Their removal wholly destroys the power of seeing, and diseases by which they are seriously affected are usually accompanied with blindness. Disease or destruction of one *corpus quad.* produces blindness of the opposite eye. Probably their connection with vision is not their only function.

The *optic thalami* probably participate slightly in the visual function of the corpora quadrigemina; but we have no definite evidence on this point. They are intimately connected with the power of movement. Destruction of one of them causes rotation of the animal, similarly to division of one of the crura cerebri. Longet has shown, that

after removing all the cerebral hemispheres and the *corpora striata*, the animal can still stand and walk, but that on removing one of the optic thalami, it falls down paralyzed on the opposite side, or commences rotatory motion.

The function of the *corpora striata* is very uncertain; they have probably some connection with sensation and volition, the precise nature of which is at present unknown.

The parts hitherto considered—including the cerebellum—appear to comprise the apparatus (1.) For the direction and government of all the unfelt and involuntary movements of the parts which they supply; (2.) For the perception of sensations; and (3.) For the direction of such instinctive and habitual movements as do not require the exercise of any reasoning or intellectual act. They cannot be regarded as organs of the higher faculties of the mind.

The functions of the *cerebral hemispheres* are, in the words of Dr. Kirkes (*Handbook of Physiology*), those of organs by which the mind, 1*st*, perceives those clear and more impressive sensations which it can retain and judge according to; 2*d*, performs those acts of will, each of which requires a deliberate, however quick, determination; 3*d*, retains impressions of sensible things, and reproduces them in subjective sensations and ideas; 4*th*, manifests itself in its higher and peculiarly human emotions and feelings, and in its faculties of judgment, understanding, memory, reflection, induction, and imagination, and others of the like class.

"The evidences that the cerebral hemispheres are, in the sense and degree indicated above, the organs of the mind, are chiefly these: 1. That any severe injury of them, such as a general concussion, of sudden pressure by apoplexy, may instantly deprive a man of all power of manifesting externally any mental faculty; 2. That in the same general proportion as the higher mental faculties are developed in the vertebrate animals, and in man at different ages, the more is the size of the cerebral hemispheres developed in comparison with the rest of the cerebro-spinal system; 3. That no other part of the nervous system bears a corresponding proportion to the development of the mental faculties; 4. That congenital and other morbid defects of the cerebral hemispheres are, in general, accompanied with corresponding deficiency in the range or power of the intellectual faculties and the higher instincts." See MIND, THE HUMAN.

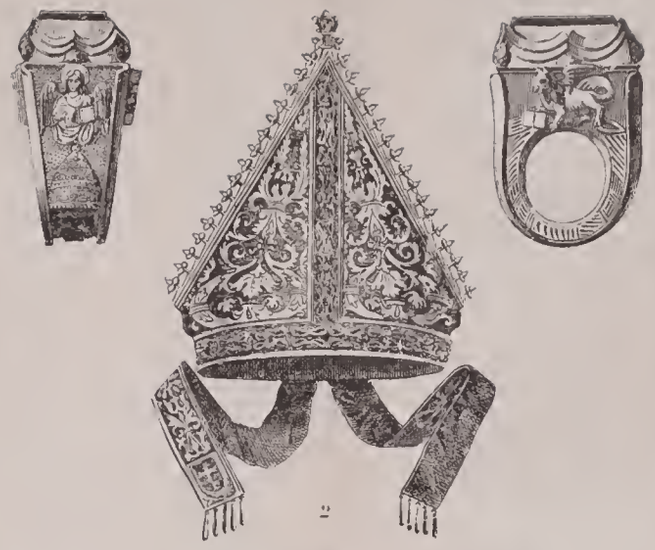
Cerebellum.—The functions of this organ have been made the subject of much discussion and investigation. It is itself insensible to irritation, and has been cut away in various animals (by Longet and other French physiologists), without eliciting signs of pain; moreover its removal or disorganization by disease is generally unaccompanied with loss or disorder of sensibility, animals from whom it has been removed being apparently able to smell, see, hear, and feel, as perfectly as before. Flourens seems by his vivisections to have arrived at the correct view regarding the functions of this organ, and his results have been fully confirmed by Longet and others. He extirpated the C. in birds by successive layers. Feebleness and want of harmony of the movements resulted from the removal of the superficial layers; when he reached the middle layers, the animals became restless; their movements were violent and irregular; but they were not convulsed, and their sight and hearing were perfect. By the time that the organ was entirely removed, the animals had completely lost the power of flying, walking, standing, and preserving their equilibrium. When a pigeon in this state was laid upon its back, it could not recover its former position; but fluttered its wings, and saw and tried to avoid a threatened blow. Hence volition, sensation, and memory were not lost, but merely the faculty of combining the actions of the muscles. From a large series of experiments of this kind, subsequently made on all classes of animals, Flourens infers that the C. belongs neither to the sensitive nor to the intellectual apparatus; and that it is not the source of voluntary movements, although it belongs to the motor apparatus; but that it is the organ for the co-ordination of the voluntary movements, or for the excitement of the combined and harmonious action of the muscles.

This view is confirmed by the phenomena observed in certain cases of disease, and to a certain extent by comparative anatomy, for to each of the four classes of vertebrata—if we reckon amphibians and reptiles as a single class—the species whose natural movements require the most rapid and exact combinations of muscular actions are those in which the C. is most developed in proportion to the spinal cord; and if we compare different species of the same class, we usually find the development of the C. to correspond very closely with the perfection and variety of the muscular movements. For example, in the frog the movements are exceedingly simple in character, consisting of little else than flexion and extension of the posterior limbs; and the C. of this animal is extremely small compared with the rest of the brain, being merely a thin narrow band of nervous matter. In the common sea-turtles, the movements of the body are of a more varied character, and the motions of the head and neck are more extensive; and here we have a much more highly developed cerebullum. In the alligator, again, a reptile whose motions closely resemble those of quadrepeds, the C. is still more fully developed.

The influence of each half of the C. is directed to the muscles of the opposite side of the body, and for the right ordering of the movements, the actions of its two halves must be mutually balanced and adjusted; for if the nervous structures uniting one of the halves of the C. with the medulla oblongata and spinal cord be divided, strangely disordered movements occur, the animal falling down on the side opposite to that which



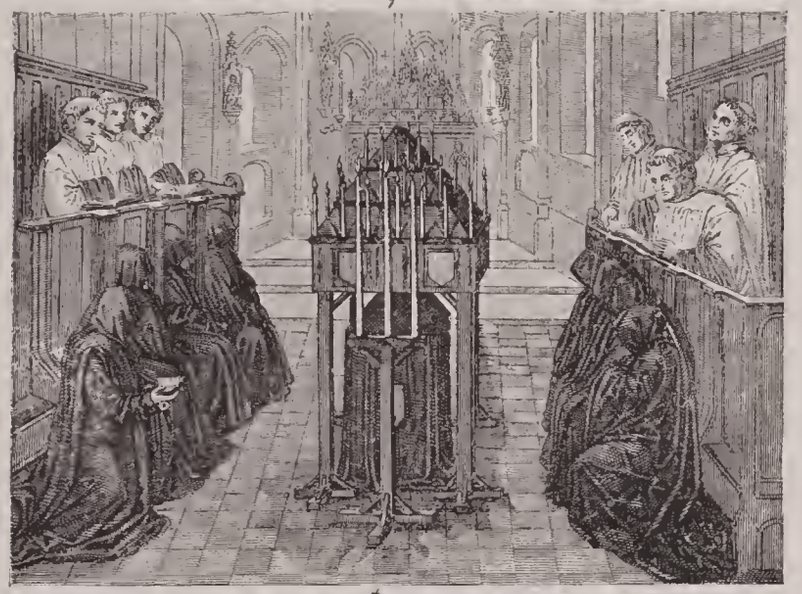
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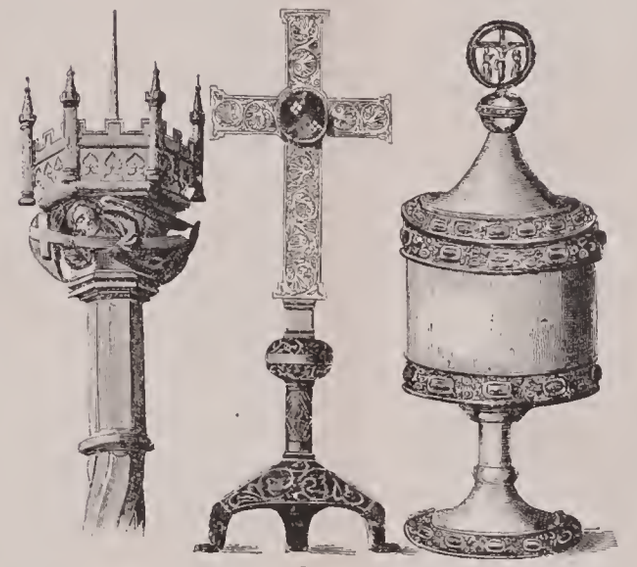
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CEREMONIES.—1, 3. Sacraments of the Roman Catholic Church (15th century). 2. Bishop's mitre (1500) ; bishop's rings (14th century). 4. Death-watch. 5. Processional candlestick (15th century) ; crucifix (12th century) ; ciborium (13th century). 7. Baptism of the Reformed Church (18th century). 8. Thurible (12th century) ; holy water vessel (11th century).

has been injured, and continually rotating round the long axis of its body, sometimes for several days, at the rate of fifty or sixty times in a minute. Similar movements have been observed in men in whom one of the crura of the C. has been diseased.

Phrenologists are of opinion, in accordance with the view originally propounded by Gall, that the C. is the seat of the sexual impulse and instincts; but this view has been long abandoned by almost all physiologists, for the reason that it has not been found to be sufficiently supported by anatomical and experimental facts, many of which are indeed directly opposed to it.

Our limited space compels us to leave altogether untouched many most interesting topics in cerebral physiology, as, for instance, the quality of the brain, the plurality of the cerebral organs, etc. The reader who wishes for further information, is referred to Kirkes's *Physiology* (from which we have freely quoted), Carpenter's *Human Physiology*, Noble *On the Brain*, Holland's *Chapters on Mental Physiology*, and Brodie's *Psychological Inquiries*.

CEREMONY (Fr. *cérémonie;* Lat. *cærimonia*, a sacred rite). Almost any act, when performed in a regular, orderly, and formal manner, and when viewed, not with reference to its object, but the mode of its performance, becomes a C.; and the more entirely the attention of the performers is withdrawn from the object of the act, and fixed upon the manner of its performance, the more *ceremonious* does it become. The purely formal character of C. is thus illustrated by Hooker: "The name ceremony," he says, "we do not use in so large a meaning as to bring sacraments within the compass and reach thereof, although things belonging to the outward form and seemly administration of them are contained in that name." The remark is applicable to the most trivial ceremonies of social life and of state pageantry, as well as to the most sacred rites of religion, for a C. which is its own object would scarcely be entitled to be regarded even as a ceremony. The most empty display has always the ulterior object of imposing on somebody.

Ceremonies may be divided into four classes: 1. Religious ceremonies; 2. Social ceremonies; 3. State ceremonies; 4. International ceremonies.

Religious and state ceremonies will be treated of respectively under their various denominations; see, for the first, Rites, Liturgy, Mass, Processions, etc., and for the second, Coronation; Court; Court, Presentation at; Parliament; etc. Social C. will in a great measure fall under the heads, Etiquette, Precedency, Courtesy, Forms of Address, etc.; and international C. under Diplomacy, Consul, Ambassador, etc.

CEREOP'SIS (Gr. wax-face), a genus of birds of the family *anatidæ*, to which the New Holland goose (*C. Novæ Hollandiæ*) belongs. This bird has been known since the southern shores of that country were first visited by navigators. There, and on the adjacent islands, it is found in great abundance; and the earlier navigators easily supplied themselves with fresh provisions by knocking them down with sticks, so little were they acquainted with the danger to be apprehended from man. The cere is remarkably large, whence the name.

CE'RÉS, among the Greeks named *Dēmēter*, daughter of *Chronos* (Saturn), by *Rhœa* (Ops), sister of Jupiter, Neptune, Juno, etc. She had the misfortune, along with her other brothers and sister, to be devoured by her father, who, however, vomited her forth again after taking the emetic which Metis gave him. By her brother Jupiter she became the mother of Persephone or Proserpina (q.v.). The chief myth relating to C. tells how her daughter Proserpina was stolen by Pluto, and how the mother wandered far in quest of the maiden. After traveling in human form nine days, and everywhere distributing her gifts to mankind, she excited the pity of Jupiter, by whom Mercury was dispatched to bring back Proserpina from the infernal world, but on the condition that she must spend there a third part (or, as others say, one half) of every year. The myth of C. was symbolical of the growth of grain; some consider that this is intimated in the name Demeter, which is thought to be equivalent to *ge meter*, "Mother Earth." The relations of the worship of C. with agriculture, social order, etc., were expressed in her two great festivals—the *Eleusinia* (q.v.) and *Thesmophoria* (q.v.). C. was especially worshiped in Crete, Delos, Sicily, Asia Minor, Arcadia, Argolis, and Attica. Bulls, cows, pigs, honey-cakes, and fruits were offered to her. Among the Romans, her festivals were styled Cerealia; and of these, the most interesting was the feast celebrated by the rural population shortly before harvest, when the country people, dressed in white, and crowned with oak-leaves, danced and sang harvest songs in honor of the goddess. The feast in April lasted several days, and was celebrated by games of the circus. C. was represented, most commonly, in a chariot drawn by dragons, having her head crowned with a garland of corn-ears, and holding a torch, a basket, or a poppy in her hand.

CERES, one of the planetoids (q.v.), and the first of them that was discovered. It was first seen by Piazzi at Palermo, Jan. 1, 1801. He continued to observe its motion till the 13th of Feb., when illness obliged him to discontinue his observations, which, however, sufficed to enable astronomers approximately to calculate its orbid. It was nearly a year after before it again became visible, owing to its approach to the sun.

C.'s magnitude is less than that of the moon; and it looks like a star between the seventh and eighth magnitudes.

CEREUS, a genus of plants of the natural order *cacteæ* (q.v.), containing about 100 known species, among which are some of the most splendid flowers of that order. One of these is *C. speciosissimus*, now one of the most common greenhouse plants in Britain, and sometimes cultivated even in windows. Its large flowers are of a fine scarlet color, the inner petals with a violet tinge: they spring singly from the younger branches. The fruit, when well ripened, is of a delicious flavor. The plant is a native of Mexico.

CERIGNOLA, a t. of Italy, in the province of Foggia, 23 m. s.e. of Foggia. It is divided into two parts—the old and new town, in the former of which a portion of the ancient walls still remain—and is celebrated for the decisive victory obtained over the French by the Spaniards in 1503, and which established the supremacy of Spain in Naples. C. has manufactures of linen, and a trade in cotton and fruits. Pop, '81, 22,659.

CERĪGO, one of the smaller of the seven Ionian islands, was anciently called Cythera; is situated in the Mediterranean, and is separated from the coast of Morea by a narrow strait; lat. 36° 28′ n., long. 23° e. It has an area of 107 sq.m., with a pop., in 1870, of 10,637. With the exception of a few tracts of land, it is a very barren, dry, and mountainous island. In some parts, however, corn, wine, and olive-oil are raised. There are two great caverns in the island—one in the sea-cliff at the termination of the wild glen of Milopotamos; the other known by the name of the cavern of St. Sophia, from a small chapel at its mouth dedicated to this saint, is situated at about one and a half hour's ride from Capsali (q.v.), the capital of the island. The former cavern is said to be 3 m. in length, and so low that it is necessary to creep, in many places, on hands and knees to explore it. The latter—that of St. Sophia—is a very remarkable one, and possesses singular beauty; it abounds in enormous stalactites of various shapes and great beauty. In ancient times, C. was sacred to Venus, being, according to the old mythology, the island that received this goddess when she arose from the sea.

CERIN′THUS (abusively named MERINTHUS, i.e., a halter), a heretic who lived at the close of the apostolic age, but of whom we have nothing better than uncertain and confused accounts. It is said that he was a Jew by birth, and studied philosophy in Alexandria. From Egypt he passed into Asia Minor, and lived in Ephesus contemporaneously (according to the belief of the church) with the aged apostle John. Tradition tells us that John held the heretic in such detestation, that, on a certain occasion, when he encountered C. in the baths of Ephesus, he immediately left the place, saying to those about him: "Let us flee home, lest the bath should fall while Cerinthus is within." It was believed in the ancient church, that the gospel of St. John was written in opposition to the tenets of C.; and the Roman presbyter Caius (about she close of the 2d c.) supposed that C. had revenged himself by falsely ascribing the authorship of the Apocalypse to St. John—it being in reality his own work! The fathers contradict one another in their accounts of Cerinthus. Some describe him as a complete Gnostic, in which case he would be the earliest recorded teacher of that sect; others say that he held coarse and sensual millenarian views, making the *millennium* (q.v.), with the licentious fancy of an Arab, consist chiefly in "nuptial delights;" and that he believed the Jewish ceremonial law to be in part binding upon Christians. There can be no doubt that C. made use of the Jewish law at least as a symbol for his Gnostic doctrines, and also employed millenarian terms in a symbolical manner; a very natural thing for him to do, on the hypothesis which Neander and others have suggested—that Gnosticism originated, not among the minds which had received a true Hellenic culture, but among the Judaizing sects, whose theosophy was a jumble of the spiritual and the material. C. being the oldest teacher of Judaico-Gnostic principles, there would naturally be a greater incongruity and want of harmony in his language and ideas than characterized Gnosticism at a later period of its development; and subsequent ecclesiastical writers, destitute as all of them were of precise historical knowledge and sound principles of criticism, could hardly avoid misunderstanding a system which is not consistent throughout, but bears evident marks of being formed in a transition epoch.—Paulus *Historia Cerinthi* (Jena, 1799); Neander, *Kirchengeschichte*, vol. i., part 2.

CE′RITE, or O′CHRÖITE, is the *silicate of cerium*. It is found as a mineral in gneiss, at Westmanland, Redderhyttan, and Bastnäs. It contains in 100 parts—silica, 16; peroxide of cerium, 26.55; oxide of lanthanum, 33.38; carbonic acid, 4.62; alumina, 1.68; peroxide of iron, 3.53; lime, 3.56; oxide of manganese, 0.27; and water, 9.1. It occurs in granular pieces of a clove-brown, cherry-red, or gray color, with a white streak, a splintery fracture, an adamantine luster, and is translucent at the edges.

CERI′THIUM, a genus and the type of a family, *cerithiadæ*, of gasteropodous mollusca of the order *pectinibranchiata* of Cuvier. The shell is spiral, elongated, and many-whirled, with an oval oblique aperture, which has a short canal in front. The species of this family are numerous, most of them marine, but many inhabiting estuaries and brackish rather than salt water; some are found in lakes and rivers. A few belong to temperate climates, but most of them are tropical, and in mangrove swamps they par-

ticularly abound. The fossil species are very numerous, almost all limited to the tertiary formations. See BAGSHOT BEDS.

CE'RIUM is a rare metal found native in cerite (q.v.) and a few other minerals. It is a white metal, has not been obtained in any quantity, is not therefore employed in any manufacture, and forms two oxides and a numerous class of salts.

CERNUSCHI, ENRICO. See page 892.

CEROPLAS'TIC (Lat. *cera*, wax), the art of modeling in wax. See WAX-WORK.

CEROSTRO'TUM, or CESTRO'TUM, (Lat.), a species of encaustic painting upon horn or ivory, the lines of the design being burned in with the *cestrum* or burning needle, and wax introduced in the furrows thus made.

CEROX'YLON. See WAX PALM.

CERR'ETO, a t. of South Italy, in the province of Benevento, situated on a slope of the Apennines, about 22 m. n.e. of Capua. It is a well-built town, with a cathedral, and manufactures of coarse cloth. The district produces good wine. Pop. 6,469.

CERRO DE PASCO, or PASCO. See CERRO GORDO, *ante*.

CER'RO GOR'DO, the name of several localities of Spanish America.—1. A plateau in Mexico, the most easterly on the route from Vera Cruz to the capital. Here, on the 18th April, 1847, the Americans totally defeated the Mexicans.—2. A city of Peru, the capital of the province of Pasco, in the department of Junin. It is in the vicinity of the richest silver mines in the republic; and standing at an elevation of 14,100 ft., it has, all the year round, the temperature of an English winter. The estimates of the population range from 7,000 to 16,000. C. G. is 140 m. to the n.e. of Lima.

CERRO GORDO. See CERRO GORDO, *ante*, a mountain pass on the national road from Vera Cruz to the city of Mexico. April 18, 1847, gen. Scott with a United States force of 8,500 defeated Santa Anna, the Mexican leader, with 12,000 men, at this place. The Mexican loss was from 1,000 to 1,200 killed and wounded and 3,000 prisoners; that of the other side, 63 killed and 368 wounded.

CERRO GORDO, a co. in n. Iowa, intersected both e. and w., and n. and s. by railroads, and watered by Shell Rock river, Lime creek, and the head waters of Beaver Dam river; 652.sq.m.; pop. '80, 11,461. It is an agricultural region. Co. seat, Mason City.

CERRO GORDO DE POTOSI', a mountain in Bolivia, directly s.w. of Potosi, containing very rich silver mines. The summit is 16,150 ft. above sea level.

CERTALDO, a market t. of central Italy, is picturesquely situated on the Elsa, about 18 m. s.w. of Florence. It is noteworthy as the residence of Boccaccio, as well as the scene of his death. His house, surmounted with a tower, is still standing, and contains the articles of furniture belonging to the poet's time, and a fresco painting of him by Benvenuto Cellini. Pop. 6,562.

CERTHI'ADÆ, a family of birds, generally placed in the great order *insessores* or *passerinæ*, and tribe *tenuirostres*, although some naturalists have ranked them in the order *scansores*. They mostly live on the trunks and branches of trees, feeding on insects which they find in the crevices of the bark; and many of them aid themselves by their stiff tail-feathers in retaining their position as they search for their food on the perpendicular stem. Their claws are long and sharp; the hind-toe is also elongated, so that they can take firm hold of the bark or of a small branch; and many of them can pass round a horizontal branch, clinging to its under-surface with their backs to the ground. The bill of many is slender and curved; others, however, have a comparatively short and straight bill. The tongue is cartilaginous at the extremity, and so fitted to aid in seizing insect prey. The plumage is usually dull and uniform; but the birds are lively and active in their habits. The species are numerous and widely diffused; they are divided into a number of genera. All of them are small birds. The creepers (q.v.), forming the genus *certhia*, are regarded as exhibiting the type of the family. Wrens and nut-hatches, although referred to it, depart very considerably from this type. Many small tropical and subtropical birds, which live by sucking honey from flowers, formerly referred to this family, are now separated from it.

CERTIFICATE, a written testimony to the truth of a certain fact or facts. The law of England recognizes certificates for various purposes. 1. Annual C. of attorneys. See ATTORNEY. 2. C. of appointment of the creditors' assignees to a bankrupt's estate and effects. 3. C. of conformity of a bankrupt. 4. C. of counsel, to enable a pauper to litigate *in formâ pauperis*. 5. C. of the judges of the superior common-law courts at Westminster, which are of various kinds and for various purposes. 6. C. of registry of a ship; which is a copy of what is entered in the registry of the ship in the books of the custom-house. This C. is granted by the collector, comptroller, or principal officer of the customs at the port of registry, and delivered to the captain as a voucher of the character and privileges of the vessel as a British ship.

CERTIFICA'TION, in the law of Scotland, signifies the judicial assurance given to a party of the course to be followed by the judge in case he disobeys the will of a summons, or other writ or order of the court. Reiterated contumacy on the part of the defender was at one time punished with confiscation of his property (1449, c. 29), but now C. amounts to nothing beyond an intimation that if he fails to appear in the usual

manner, the judge will decern, or pronounce judgment against him. The most important C. is in the process of reduction-improbation (q.v.). In this action, two terms are allowed for the production of the deed called for, and sought to be reduced. Thereafter, an additional ten days are given; but should production not be satisfied on their expiry, decree of C. will be pronounced, and this decree has the effect of declaring the deed to be forged and fabricated. Such a decree, even though pronounced in absence, can hardly be recalled. In simple reduction (see REDUCTION), the C. is only to the effect that the deed shall be void and null, till produced.

CERTIFIED COPY. See EVIDENCE.

CERTIORA'RI (Lat. to be certiorated, or more fully and accurately informed of), in English law, is an original writ issuing, in civil cases, out of the chancery division of the high court of justice, and in criminal from the queen's bench division of the same court. This writ, which runs in the queen's name, is addressed to judges or officers of an inferior court, commanding them to certify or to return the records of a cause depending before them, in order that the party may obtain more sure and speedy justice, from such justices as shall be assigned to determine the cause. A writ of C. may be granted at the instance either of the prosecutor or defender; but to prevent its being used as an instrument of oppression by the one party against the other, it is provided (5 and 6 Will. IV. c. 33, and 16 and 17 Vict. c. 30) that either party, before applying for it, must obtain the leave of the court, and enter into recognizances.

The writ passes on a *bill of C.*, which states the proceedings in the inferior court, so far as they have gone; sets forth the alleged ground of incompetency, by suggesting that the cause is beyond the jurisdiction of the court, that the defendant or witnesses live beyond it, or the like reason why substantial justice cannot be done. The writ is now chiefly used in the queen's bench division, and is the usual mode of correcting excesses of justices of the peace in miscellaneous matters.

CERTIORA'RI (*ante*), a writ by a superior to an inferior court of record, requiring the latter to send to the former some proceeding pending, or the record of some cause terminated in cases where the proceedings were not in accordance with the course of common law. The writ is granted or refused at the discretion of the superior court, and the usual result is that the proceedings below are either quashed or affirmed.

CERTO'SA DI PA'VIA, LA, one of the most celebrated monasteries in the world, is situated in the neighborhood of Pavia, and was founded, 1396, by Giovanni Galeazzo Visconti, first duke of Milan, to appease his conscience for the murder of his uncle. The church is a splendid structure in the form of a Latin cross, the ground-plan being 249 ft. long by 173 ft. broad. It has altogether 12 chapels, 7 in the whole length of the church, and 5 in the transept, some of which are decorated with fine frescoes and paintings. The richly sculptured façade, designed by Ambrogio da Fossano, named Borgognone, was commenced in 1473. The building is made up of various styles, but the pointed prevails in the interior, which is decorated with frescoes, paintings, etc., by Dan Crespi, Andrea Solari, Campi, and Ambrogio Fossano, and contains a gorgeous high-altar, the mausoleum of the founder, and several monuments.

CERU'MEN. This term is applied to yellow waxy matter which is secreted by certain glands lying in the external auditory canal, or the passage that leads from the external opening of the ear to the membrane of the tympanum. Its main use, doubtless, is to lubricate this passage. It possesses a peculiarly bitter taste, and some physiologists have believed that in consequence of this property it prevents insects from entering the auditory canal. It is popularly known as ear-wax.

CERUSE, or WHITE-LEAD, the basis of white oil-paint, is a *carbonate of lead.* It has several other names—krems, Nottingham white, flake-white, etc. Like all other preparations of lead, C. is liable to be acted upon by exhalations from sewers, or by anything which contains sulphuretted hydrogen, in which case it is changed to a dull and leaden hue. Neither will it bear to be mixed with any pigment containing sulphur, such as vermilion. It is supposed that the white oxide of zinc might be substituted for C. as a white pigment with advantage.

CERUT'TI, GIUSEPPE ANTOINE JOACHIM, 1738–92; a Jesuit and professor in the college of that order in Lyons. Among his works are an *Apology for the Institute of the Jesuits;* a *Memoir of the People of France;* a poem entitled *The Garden of Bietz.* He also edited a weekly journal, and was once elected to the legislative assembly.

CERVAN'TES SAAVE'DRA, MIGUEL DE, one of the greatest imaginative writers of Spain, was b. of an old Galician family, at Alcala de Henares, Oct. 9, 1547. He studied at Salamanca, and afterwards at Madrid, where he was placed under the care of a learned theologian, Juan Lopez de Hoyos, who was then professor of belles-lettres in the university. But his natural love of poetry led him to spend most of his time in writing elegies, ballads, sonnets, and a pastoral romance entitled *Filena.* When 22 years old, C. served for some time as valet-de-chambre to cardinal Giulio Aquaviva of Rome. In 1570, he served as a volunteer under the command of the papal admiral, Marco Antonio Colonna, and fought gallantly against the Turks. At the battle of Lepanto, he was maimed for life by a gunshot wound in the left hand. He afterwards took part in various campaigns. Captured by an Algerine squadron, he was made a slave, but was ran-

somed in 1580, after a four years' captivity. On his return to Spain, he rejoined his regiment in the army sent by Philip II. to support his claims in Portugal, and distinguished himself in the expedition to the Azores. In 1584, he returned to Spain, and retired into private life, to devote his attention to literature. Soon after his publication of the pastoral romance, *Galatea* (1584), he married, commenced writing for the stage, and produced, in the course of a few years, as many as 30 dramatic pieces, of which the tragedy *Numancia* is the most remarkable. During the years 1588–99, he lived in straitened circumstances in Seville. In 1605, he once more appeared as an author, and now in a sphere exactly suited to his genius. In his immortal work, *Don Quixote*, C. intended to put an end to that taste for extravagant romances of chivalry which had so long prevailed. The first part of this great satirical work appeared in Madrid, and was received at first coolly, but soon afterwards with loud applause, which, at a later period, was echoed from all parts of educated Europe. *Don Quixote*, though written with a satirical purpose, is throughout pervaded by the true spirit of poetry. With that universality which belongs to the highest genius, C. connected a universal human interest with descriptions of local and temporary characteristics. He did not intend by his *Don Quixote* to burlesque the old Spanish knight-errantry, for, as Mr. Ford remarks (see *Handbook of Spain*, part i., p. 238), "the thing had expired a century before his birth;" but to put an end to the absurd and affected romances which it was then the fashion to read, and which were believed to be true pictures of chivalry. He had also, it is quite clear, another object in view—viz., to show that the deeper and truer and more guileless a nature is, the more will it become the jest and butt of real life; but he likewise teaches us that the pure heart and the high soul obtain a triumph which misfortunes and blunders cannot tarnish; for the knight always "disinterested, generous, elevated, and beneficent," though "the sweet bells of his intellect are jangled and out of tune," maintains throughout a firm hold on our affections and esteem. Charles Lamb has truly said, that readers who see nothing more than a burlesque in *Don Quixote*, have but a shallow appreciation of the work.

Though received with enthusiasm, *Don Quixote* brought no pecuniary reward to the author. He was left in the obscurity and poverty in which he had passed so many years, and vainly endeavored to improve his circumstances. After silence during several years, C. published his twelve *Novelas Examplares* (Exemplary Tales), 1613; his *Viage al Parnaso* (Journey to Parnassus), 1614—his next best production to *Don Quixote;* and in the following year he produced eight new dramas, but these were indifferently received. In 1614, a certain Alonso Fernandez de Avellaneda published at Tarragona a so-called continuation of *Don Quixote*, which was made a vehicle of abuse lavished on Cervantes. It appears that C. suffered considerably under these despicable attacks; but he revenged himself in noble style by publishing (1615) the *true* continuation of *Don Quixote*. Near the close of his career, C. found a patron in the count of Lemos, who relieved his poverty. During the last few years of his life, he resided in Madrid, where he died, April 23, 1616. No stone marks the spot where his remains were interred. His novel, *The Sorrows of Persiles and Sigismunda*, was posthumously published. In 1835, when the house in which the poet had lived in Madrid was rebuilt, a bust of C., by the sculptor Don Antonio Solá, was placed in the front.

Among the several editions of *Don Quixote*, we may mention the splendid one in 4 vols. (Madrid, 1780); that by Pellicer (5 vols., Madrid, 1798); the fourth published by the Madrid academy, with an admirable life of C. by Navarette (5 vols., Madrid, 1819); Diego Clemencin's edition, with the most complete commentary (6 vols., Madrid, 1833–39); and a good pocket-edition, published at Leipsic (6 vols., 1800–7). Of the collected works of C., an edition, not containing the comedies, appeared at Madrid (16 vols., 1803–5); and another, without the *Journey to Parnassus*, was published in the same city (11 vols., 1829). Don Aug. Garcia de Arrieta published a selection from the works of C. (10 vols., Paris, 1826–32); and a reprint of the collected works is included in Baudry's *Celeccion de los Mejores Autores Españoles* (Paris, 1840–41). England has been fertile in translations of C.'s immortal work. The first is that of Thomas Skelton (1612–20), in addition to which may be mentioned those of Philips, Motteux, Smollett, Durfey, Jarvis, Wilmot, and Clark. The best are those of Skelton, Jarvis, and Clark.

CERVE'RA, a t. of Spain, in the province of Barcelona, 28 m. e. of the city of Lerida. It is situated on an eminence, is surrounded by old walls pierced with nine gates, and the west approach is commanded by a castle, which is now in a ruinous condition. The university of Lérida was removed here by Philip V., but it was afterwards transferred to Barcelona. The university building, a massive but unsightly edifice, is still standing. C. has manufactures of linen, woolen, and cotton fabrics. Pop. 5,300.

CERVE'TERÉ, or CERVE'TRI (ancient Cære or Agylla), a t. of central Italy, 27 m. w. of Rome. Though now a place of some 700 or 800 inhabitants, it was formerly one of the most important cities of Etruria, possessing, it is said, a famous collection of paintings before even Rome was founded. Many Etruscan remains of value have been found here.

CERVET'ERÉ, or CERVET'RI (*ante*), a village on the site of the ancient Cære, in s. Etruria, near the Tyrrhenian sea, in the district of Civita Vecchia, 32 m. from Rome. It afforded refuge to the Tarquins after their expulsion from Rome, and was by the

Romans chosen as the safest hiding-place of their treasures during the occupation of the capital by the Gauls. The old city thenceforward declined, and in 1250 was deserted by a large portion of its inhabitants, who removed to the present village of Ceri. From the fact that the old inhabitants were admitted to Roman citizenship without the right of suffrage, the "Cærite franchise" came to be a proverbial expression denoting disfranchisement. Many interesting Etruscan remains have been found in the tombs of the city. One of the sepulchres belonged to the Tarquin family.

CER'VIA, a t. of central Italy, situated on the Adriatic, 13 m. s.s.e. of Ravenna. It is regularly built, has a cathedral and several convents; and from a marsh in the neighborhood about 50,000 tons of salt are annually obtained, the salt-works employing a considerable number of the population, which is about 6,000.

CERVIDÆ AND CER'VUS. See DEER.

CERVIN, MONT (Ger. *Matterhorn;* Ital. *Monte Silvio*), a mountain of the Pennine Alps, about 40 m. e.n.e. of Mont Blanc, and between the Valais in Switzerland and the Val d'Aosta in Piedmont. Above an unbroken glacier line of 11,000 ft. high, it rises in an inaccessible obelisk of rock, more than 3000 ft. higher, and is described by the late prof. Forbes as the most striking natural object he had ever seen. The total elevation of the mountain is 14,836 feet. The Col of Mont C., used as a passage for horses and mules in summer, has an elevation of 10,938 feet.

CERVINA'RA, a t. of Italy, in the province of Avellino, 12 m. n.w. of Avellino. It has a convent and several churches, and a trade in the produce of the district. Pop. 2,328.

CE'SARI, GIUSEPPE (sometimes called GIUSEPPINO, or IL CAVALIERE D'ARPINO), an Italian painter, was b. at Rome, 1570, and d. there in 1640 (or 1642). He was greatly honored by no less than five popes, and his paintings were always highly popular. His works—in fresco and oil—display lively imagination, gay coloring, and great tact in execution; but are deficient in natural simplicity, correctness of design, symmetry of arrangement, and dignity of style. As he was the most brilliant of the mannerists, he was the chief object of the attacks made by the artistic reformers, Caravaggio, the Caracci, and their followers—who constituted the *naturalisti*—on the conventional or pseudo-idealistic style of painting.

CESAROT'TI, MELCHIORE, an excellent Italian poet, was b. at Padua, 15th May, 1730, and d. 3d Nov., 1808. He gained a reputation by the vigor and originality of his style, especially in his translation of Macpherson's *Ossian* (2 vols., Padua, 1763). The versification of this work, like that of C.'s free translation of the *Iliad*, under the title of *La Morte di Ettore*, was admired by Alfieri. C. unquestionably threw fresh life into Italian literature, but few in this country will consider his enthusiasm very rational, when it could induce him to think poor Macpherson a better poet than Homer. C.'s best work was his *Saggio sulla Filosofia delle Lingue* (Padua, 1785), written in opposition to the academical pedantry of La Crusca. His prose style is vigorous, but full of innovations, especially Gallicisms.

CESE'NA, a t. of central Italy, about 12 m. s.e. of Forli, on the Emilian Way. It is pleasantly situated on a hill-slope, washed by the Savio. Its principal buildings are the *Palazzo Pubblico*, the Capuchin church, and the library founded by Domenico Malatesta Novello, in 1452, with a rich collection of MSS. There are many monasteries and nunneries, as befits a place that gave birth to two popes—Pius VI. and VII. It has some silk factories, with a trade in wine and silk; and in the vicinity are productive sulphur-mines. Pop. '79, 38,144.

CESNO'LA, LUIGI PALMA DI, LL.D., Count, b. in Turin, Italy, 1832. When but 15 years old he enlisted in the war against Austria. In 1850, he graduated from the Turin royal military academy, receiving a commission which he surrendered in 1854. In the Crimean war he was a staff officer. He emigrated to New York in 1860, and began teaching languages. The next year he married one of his pupils, a daughter of commodore Reid, of the U. S. navy. In the war of the rebellion, he was col. of cavalry and participated in many engagements until June, 1863, when he was wounded and made prisoner. He was exchanged not long after, and left the service at the close of the war, with the rank of brig.gen.; at once became an American citizen, and was appointed consul at Cyprus. There he soon interested himself deeply in archæological researches, and brought to light some of the most valuable remains of ancient Greek art thus far recovered (see ARCHÆOLOGY). Gen. Cesnola has devoted the greater portion of his time to Cyprian or Grecian exploration for the past 15 years. In 1878, he gave lectures in New York and elsewhere, and in 1879, was made a director of the metropolitan museum of art, in which his great collection is deposited. (See NEW YORK CITY.)

CÉSPEDES, CARLOS MANUEL DE, b. in Cuba, 1819; educated in the university at Havana, and admitted to the bar. He traveled in Europe and learned several languages. At Madrid he was concerned with Prim in a conspiracy to overthrow the government, and was compelled to fly. He returned to Cuba and began the practice of law. When Lopez made his revolutionary experiment, C. sympathized with the acts and was

imprisoned. When the revolt of 1868 began he was the leader, and one of his first acts was to liberate the slaves on his sugar estate. On the 10th of Oct., 1868, he proclaimed the independence of Cuba on the field of Yara, and when the republic was formally organized, April 10, 1869, he was elected president. The attempt at revolution was kept up at intervals until 1878. On the 21st of Feb., in that year, the rebellion was officially declared at an end. C. was killed by the Spaniards, 1874.

CÉSPE'DES, PABLO DE, 1538–1608; a Spanish theologian, linguist, poet, painter architect, and sculptor; b. at Cordova, and educated at Alcalá de Henares, and in art at Rome. He was a bold and correct draughtsman, a skillful anatomist, and a master of color and composition. His best picture is "The Last Supper," at Cordova. But little of his poetry has been preserved, the most important being fragments of *The Art of Painting*. C. held the office of prebend of the cathedral of Cordova.

CESS, probably a corruption for *assess,* from the Ital. *assessare,* to impose a tax. It has long been used in England as synonymous with the more modern noun *assessment.* Camden, in the time of Elizabeth, speaks of every man being "cessed by the pole, man by man, according to the valuation of their goods and lands." See LAND-TAX.

CESSIO BONO'RUM (Lat. cession or surrender of goods), a process which the law of Scotland has borrowed from that of Rome, and which, like many others, is common to it with most of the continental systems. A C. B. may be defined to be an equitable relief from the severity of the earlier laws of imprisonment for debt, granted to a debtor in consideration of a cession of his goods to his creditors. The jurisdiction in cessios formerly belonged exclusively to the court of session, but by 6 and 7 Will. IV. c. 56, it was extended to sheriffs. The principal regulations, with reference to this process, at present in force, are the following: Any debtor in prison, or who has been in prison, or even against whom a warrant of imprisonment has been issued, may apply for a cessio bohorum. In his petition, he sets forth his inability to pay his debts, and his willingness to surrender his estates, and prays for interim protection. This petition must be intimated in the *Gazette.* The bankrupt then lodges with the sheriff-clerk a state of his affairs, subscribed by himself, with all the relative books and papers. On a day appointed for the purpose, he is examined before the sheriff on oath; and if his creditors object to the petition, they are heard, and a proof, if necessary, allowed them. Whatever order the sheriff may pronounce is subject to review by the court of session, or a lord ordinary in vacation. Cessios originating in the court of session are sued out in the form of a summons, by which all the creditors are called as defenders to the action. Any one or more of them may appear; and the pursuer will not be allowed the benefit of the process, till he has satisfied the court that his insolvency has arisen from misfortune, and that his disclosure of the state of his affairs is full and honest The burden of proving objections to his statements, and to the evidence which he may produce, will be laid on the creditors. If the debtor can find caution (q.v.) to attend all diets when called on, the sheriff or the court of session may grant him liberation or protection whilst the process is pending. A decree of C. B. operates as an assignation of the debtor's movable estate in favor of a trustee for behoof of the creditors. These trustees, like those in sequestrations, are now placed under the supervision of the accountant in bankruptcy. A C. B. differs from a sequestration (q.v.) in this, that it confers no power on the bankrupt to insist on his discharge, and affords no protection against the attachment of his subsequent acquisitions by his crediters. The debtor has the privilege of retaining his working tools; but nothing beyond what is necessary for mere aliment will be allowed, even to half-pay officers and clergymen.

CESTIUS, PYRAMID OF, a Roman monument of the Augustan age, situated close to the Porto San Paolo, partly without and partly within the walls of Aurelian. It is known to every English traveler, being in the immediate vicinity of the cemetery where Protestants dying in Rome are buried. The exterior form is perfectly preserved; but of the paintings which formerly decorated the internal walls, only a few traces remain. Several copies of these paintings have been made, of which we may mention those edited by Falconieri, 1661. The pyramid is 125 ft. high, 100 ft. in width at the base; the walls 25 ft. thick. It is built of brick and tufa, faced with slabs of Carrara marble, now perfectly black with age, and rests on a base of travertine 3 ft. high. The interior contains burial chambers of considerable extent. The inner walls are covered with hard stucco, and the roof is vaulted. Both the walls and the roof were covered with paintings of female figures. The memory of the Caius Cestius for whom this pyramid was built has perished, but it has been supposed that he was the Cestius whom Cicero—in the oration *pro Flacco*—mentions as a rich man of business, who, having no children, left a large sum of money for the erection of a monument to himself. Two fluted columns of white marble, now standing before the pyramid of C., with their bases and two other bases, were discovered in the excavations of 1663, at the foot of the pyramid. In the cemetery, the remains of several celebrated men have their resting-place, among whom are the poets Keats and Shelley, Wyatt the sculptor, and Bell the anatomist.

CESTOID WORMS (Lat. *cestus,* a band or throng), a family of *entozoa,* or intestinal worms, of the order *Cœlelmintha* (q.v.), consisting of tape-worms and other creatures which resemble them in structure and habits. The number of different kinds of C. W.

is great. Their natural history is important in reference to the health of human beings and of the most valuable domesticated animals; and although the subject is not in all respects an agreeable one, it presents much that is interesting and wonderful. Recent discoveries have given it an entirely new character.

C. W., in their most perfect state, when alone they possess the form from which their name is derived, are in reality compound animals, like many zoophytes and ascidians. They do not, however, like these, subsist by food entering the system through mouths with which the individuals composing it are furnished; for the joints of a cestoid worm, the individuals composing the system or "colony," have no mouth; nor is there any mouth in what is, on various accounts, quite properly regarded as the head, but nutriment is obtained from the surrounding medium by *endosmose* (q.v.); nourishing juices entering everywhere through the skin, as in the spongioles of the roots of plants, into the cellular tissue or *parenchyma* of which the whole body consists. The head of a cestoid worm is furnished with organs—different in different kinds—by which it affixes itself to the inner surface of the intestine of a vertebrate animal. When first it gets into this situation, the body is very short, and has no joints; but they soon begin to appear as transverse striæ, and gradually increasing in size, become in most of the kinds very distinct, and at last separate from the system in which they were produced, and are carried away out of the intestines of the animal which contained them. This does not take place, however, till they have not only become mature in the development of the sexual organs—the principal organs to be observed in them—but until they are full of what are called eggs, which, indeed, are rather young ones ready for a separate existence, and each enveloped in a sort of protective shell. Each joint of a cestoid worm is androgynous. Whilst the most matured joints are thrown off from the posterior end, new joints are continually formed, as at first, in the part nearest to the head. The number of joints thus formed from a single individual is very great, as will appear when it is considered that tape worms have been found 20 feet long or upwards, and that these have probably been throwing off joints in large numbers before opportunity has been obtained of measuring them.

As the C. W. have no mouth, so they have no alimentary canal. Some of them, as the true tape-worms, have been supposed to imbibe nourishment by the sucking disks of the head; but these are more probably mere organs of attachment, and the canals which are seen to arise behind them, apparently belong, not to the digestive, but to the vascular system, and are united by transverse vessels or vascular rings in the head and in each of the segments. The only trace of a nervous system hitherto observed is a single ganglion in the head, which in some is seen to send off nerves to the suckers.

The division into segments remains imperfect in some cestoid worms. Those of the genus *ligula*—chiefly found in birds and fishes—resemble a long flat ribbon, not even notched along the edge, and containing a mere series of hermaphrodite brood-places. When segmentation is perfect, the segments (*proglottides*), on separating from the parent system (*strobila*), possess life and a little power of independent motion, creeping away on moist ground, plants, etc. Their period of separate existence, however, is brief; they burst or decay, and the numerous minute embryos which they contain are ready to commence their career, if in any way transferred into the stomach of an animal of proper kind, which is generally different from that whose intestine their parent inhabited. This may happen by their being swallowed—or even the *proglottis* itself—along with water, grass, etc. Some of the C. W. in this embryo state find their appropriate place in the stomachs of vertebrate, and others in those of invertebrate animals.

The shell being broken or digested, the young cestoid worm is set free. It is extremely unlike the proglottis by which it was generated. It presents the appearance of a vesicle furnished with a few microscopic hooks. It possesses, however, a power of active migration by means of these hooks, and is able to perforate the stomach of the animal which contains it. To this its instinct seems immediately to prompt it, and it is so minute that it passes through the stomach without any serious inconvenience to the animal. It now probably gets into the blood, and is lodged in some of the capillaries, from which it makes its way again by perforation, until it finds a suitable place in some of the tissues or of the serous cavities, in the flesh, or in such organs as the liver or the brain; and here relinquishing all active migration, it rapidly increases in size, at the same time developing a head, which is in fact that of a cestoid worm, and generally either encysts itself or is encysted—inclosed in a cyst (q.v.)—according to circumstances, or according to its species. Great numbers of such parasites are sometimes present in a single animal, causing disease and even death. Until recently, they were regarded by naturalists as constituting species and genera quite distinct from the C. W., of which they are really the young; and the name *scolex*, formerly given to one of these supposed genera, has now become a common name for the young of all C. W. in this stage, as *larva* is the common name for the young of insects in their first stage after being hatched from the egg. Those scolices which inhabit vertebrate animals very generally become distended with a watery fluid, and in this state were formerly regarded as hydatids (q.v.); little else, indeed, appearing without very careful examination, but a small bag filled with fluid, the scolex head being formed within the bag, although capable of being everted from it, as the finger of a glove which has been drawn in at the end is turned out. Such is the young of the common tape-worm (*tænia solium*), formerly known to

naturalists as *cysticercus cellulosæ*, and found in the flesh of the pig and of some other animals, and sometimes of man. It is this scolex, existing in great numbers, which produces in the pig the diseased state commonly known as *measly;* and it is very unsafe even to handle measly pork in a raw state, because a scolex accidentally getting into the mouth, and thence into the stomach, is likely to become a formidable inmate of the intestinal canal. It does not appear that this particular species has the power of multiplying in its scolex state, or the circumstances in which it exists in the flesh of the pig may be unfavorable to its so doing, and the prodigious numbers sometimes existing in a single animal have probably all entered by the mouth in the way already described, the contents of a single proglottis or joint of a tape-worm being perhaps sufficient to account for them; but some scolices, as that called *cœnurus cerebralis*, found in the brain of sheep, and the cause of the disease called *staggers*—now known to be the scolex of a *tænia* of the dog—are proliferous by a sort of pullulation, so that clusters of scolices cover the same parental vesicle. Until, however, the scolex reaches the intestine of an animal suited to it, its propagation is entirely unsexual, and no organs of sex exist; but no sooner is it there, than it begins to develop itself into a cestoid worm, and to produce androgynous joints, fertile of new embryos, as already described. Thus we have in these creatures an instance, in its relations the most important known, of the recently discovered alternation of generations. See GENERATIONS, ALTERNATION OF. The transference of the scolex from its place of growth to that in which it becomes a cestoid worm, usually if not always takes place by the animal which contains it being eaten by that whose intestine is suitable to its perfect development. Each kind of cestoid worm is limited to certain kinds of vertebrate animals, and it has been proved by experiment that if introduced into the stomach of other kinds, the scolices soon die. The only C. W. which infest the human species are *bothriocephalus* (q.v.) *lutus*, and tape-worms (q.v.). See Von Siebold's interesting work on tape and cystic worms, printed for the Sydenham society (London, 1857).

CESTRA'CION, a genus of sharks, regarded as constituting a distinct family, *cestraciontidæ*, although not more than two species are known as now existing. It is characterized by having two dorsal fins and one anal, the first dorsal situated over the space between the pectorals and ventrals; a spine forming the front of each dorsal; a short, wide tail, with its upper lobe strongly notched beneath; the mouth at the fore-end of the snout; spout-holes distinctly visible, rather behind the eyes; eyes destitute of nictitating membrane; small gill-openings; and the front of the mouth armed with sharp angular teeth, whilst the margins and inner surface of the jaws are covered with pavement-like teeth, presenting a general continuity of surface, as in skates, and disposed in rounded oblique scrolls—the former evidently adapted to the seizing of food, the latter to the crushing and bruising of it. The Port Jackson shark or "nurse" (*C. Philippi*) of the Australian seas, and the cat shark of Japan and China (*C. zebra*), seems to differ chiefly in the patterns of color. The *cestraciontidæ* are particularly interesting to geologists; for the oldest fossil sharks belong in great part to this family, of which "remains are found even in the paleozoic strata; they become more numerous in the carboniferous series; they are very numerous in the lias and chalk formations; but there they cease almost entirely, the strata of the tertiary series scarcely containing any of them;" whilst now the species are reduced, as we have seen, to one or two, and other types of shark have become more prevalent.

CESTRUM, the style or spatula used by the ancients in encaustic painting in wax and ivory. See ENCAUSTIC.

CESTUI QUE TRUST, a person who possesses the equitable right to deal with property, the legal estate in which is vested in a trustee. There is such a confidence between the cestui que trust and his trustee, that no action at law will lie between them, but they must settle their differences and arrange their disputes in a court of equity. "The phrase *cestui que trust* is a barbarous Norman law French phrase, and is so ungainly and ill adapted to the English idiom, that it is surprising that the good sense of the English legal profession has not long banished it, and substituted some phrase in the English idiom, furnishing an analogous meaning."—Wharton's *Law Lexicon*.

CESTUI QUE VIE, a person whose life is the measure of the duration of an estate. If A. grants to B. an estate to be B.'s own so long as another person named C. lives, then C. is the *cestui que vie*.

CESTUS (Gr. *kestos*, embroidered), a girdle worn by Greek and Roman women close under the breasts, and so distinguished from the *zone*, worn round the loins. The C. of Venus was covered with alluring representations, so that Juno borrowed it when she desired to win the love of Jupiter.—CESTUS—or, more correctly, CÆSTUS, from the Lat. *cædere*, to slay—is also the name of the covering for the hands worn by Roman pugilists. It was at first nothing more than a leathern thong or bandage to strengthen the fist; but afterwards it was covered with knots and nails, and loaded with lead and iron, etc., to increase the force of the blow. It was not uncommon for a pugilist armed with the C. to dash out the brains or break the limbs of his antagonist. The Roman pugilist (*cæstuarius*) was often represented in sculpture.

CETA′CEA (Gr. *ketos*, a whale), an order of mammalia (q.v.) greatly differing in general form and habits from the rest of that class, so as indeed to be popularly reckoned among fishes. The C. have a fish-like form, terminating in a fish-like tail or tail-fin, which, however, is not vertical, as in fishes, but horizontal, and is the great instrument of progression; being moved by very powerful muscles, commonly with an oblique downward and lateral movement, like that by which a boat is propelled in sculling, but sometimes by direct upward and downward strokes, when greater velocity is requisite. There are no hinder limbs, and even the pelvis is represented only by two small rudimentary bones, suspended in the soft parts, so that the body tapers gradually and uninterruptedly towards the tail. The fore-limbs are exclusively, or almost exclusively, adapted for swimming; their bones, however, appearing in the skeleton as those of a hand, placed at the extremity of an arm, of which the bones are much abbreviated and consolidated, with little power of motion except at the shoulder-joint, and are entirely concealed in the soft parts of the animal. The head is connected with the body without any apparent neck, and the vertebræ of the neck are partly ankylosed or soldered together. The skin is naked, having no general covering of hair, although some of the species possess conspicuous whiskers. The C. agree with quadrupeds, notwithstanding the great differences already indicated, in the most important parts of their organization. They are viviparous, and suckle their young, for which they exhibit great affection; they are also warm-blooded, breathe by lungs, and not by gills, and come to the surface of the water for the purpose of inhaling air. An approach to their fish-like form is to be seen in seals (q.v.) and other *phocidæ* (q.v.); in which, however, the hinder limbs are largely, although peculiarly developed, whilst the fish-like tail-fin is wanting; the skin has a covering of hair; and the head and fore-limbs more resemble those of ordinary quadrupeds.

The C. are usually divided into two sections—the *herbivorous* and the *ordinary* C.; but the former, constituting the family of *manatidæ* (q.v.), have recently, by some systematic naturalists, been rejected from this order altogether, and associated with the *pachydermata*. They differ very widely from the ordinary or true C., not only in their adaptation for the use of vegetable instead of animal food, which appears both in their dentition and in their digestive apparatus, but also in their pectoral instead of abdominal teats, and in their want of *blow-holes* and of any provision for retiring to great depths of the ocean, and remaining there for a considerable time, without returning to the surface to breathe.

The ordinary or true C. are divided into the families of *delphinidæ* (dolphin, porpoise, beluga, bottlenose, narwhal, etc.), *physeteridæ* or *catodontidæ* (cacholot, or spermaceti, whale, etc.), and *balænidæ* (Greenland whale, rorqual, etc.), the distinguishing characters of which are given under separate heads. They all feed on animal food, some of them pursuing and devouring fishes; others, and these the largest, subsisting chiefly on smaller prey, mollusks, small crustaceans, and even zoophytes, which they strain out of the water by a peculiar apparatus in their mouths. None of the true C. have molar teeth or grinders like the *manatidæ;* all the teeth which any of them have are conical; but some of the largest are entirely destitute of teeth. The females of all of them have the teats situated far back on the abdomen. The fore-limbs of the true C. are mere fins, the slight power of grasping with them, which the *manatidæ* possess, having entirely disappeared. The resemblance to fishes is increased in many of them by the presence of a dorsal fin. There is a wonderful provision to enable them to spend some time under water, before returning again to the surface to breathe—an arterial plexus or prodigious intertwining of branches of arteries, under the pleura and between the ribs, on each side of the spine. This being filled with oxygenated blood, after the animal has spent some time at the surface breathing, the wants of the system are supplied from it, whilst breathing is suspended, so that some whales can remain below even for an hour. The position of the nostrils is remarkable, almost on the very top of the head, so that the animal can breathe as soon as the head comes to the surface of the water; and the nostrils are furnished with a valve of singular but very perfect construction, a sort of conical stopper of fibrous substance, preventing the ingress of water even under the pressure of the greatest depths. The nostrils appear to be little used for the purpose of smelling, the sense of smell being one which these animals either do not possess at all, or in a very imperfect degree; but they are much used, not only for breathing, but also for *spouting,* or the ejection of water from the mouth, for which reason they are generally called *blow-holes*—the water being forced through them by the compression of two large pouches or reservoirs which are situated beneath them. This compression is accomplished by an action similar to that of swallowing; the throat, however, not being open, but closed. The height to which the water is thrown into the air is extraordinary, and the spouting of the whale is one of those wonders of the ocean never to be forgotten by those who have seen it.

A peculiarity in the skin of the true C. adapts them for their manner of life. The skin is extremely thick, the inner part of it consisting of elastic fibers interlacing each other in every direction, the interstices of which are filled with oil, forming the substance usually called *blubber*. The oil deposited in this unusual situation, not only serves the ordinary purposes of fat, but that also of keeping the body warm, which to a warm-blooded animal, continually surrounded with water, is of great importance;

whilst the elasticity of this extraordinary skin affords protection in the great depths to which some of the whales descend, and in which the pressure must sometimes amount to a ton on every square inch.

The number of known species of C. is not great, but their natural history has as yet been very imperfectly studied. All of them are large animals, some of them by far the largest that now exist. Almost all of them—both herbivorous and ordinary—are marine, but some of the smaller species ascend large rivers to a great distance from the sea; and one, of the family *delphinidæ*, belongs exclusively to fresh waters, being found only in the upper tributaries of the Amazon and the elevated lakes of Peru.

Fossil cetacea have been hitherto discovered only in the tertiary formation. Their remains represent species not only belonging to each of the recent families of true C., but have supplied materials for forming a new family intermediate between the true whales and the herbivorous cetacea. These fossils were originally described as reptiles; but they have been satisfactorily shown to be carnivorous C. by Owen, who, from their remarkable conjugate teeth, has given the typical genus the name of *zeuglodon* (q.v.), and the family that of *zeuglodontidæ*. In all, six or seven species have been described belonging to this family, from the eocene and miocene beds of Europe and America. The *delphinidæ* appears first in the miocene strata, and continue through the newer beds. The remains of a narwhal, which cannot be distinguished from the living species, have been found in several places in England. Of *physeteridæ*, three species have been noticed in pleiocene and pleistocene strata, belonging to the recent genus *physeter*. Fossil *balænidæ* occur in the miocene and newer beds. Only four species have been described, if we exclude *cetotolites* (q.v.), a name given to teeth and ear-bones, belonging to animals of this family, which occur in great numbers in the Suffolk Crag.

CETEWAYO. See page 892.

CETOTOLITES, a name given by Owen to fossil cetacean teeth and ear-bones, which occur in great abundance in the Red Crag of Suffolk, a member of the pleiocene period. They are rubbed and water-worn, and have evidently been washed out of some earlier strata, which remain yet unrecognized. The extent of these earlier strata must have been very great, seeing that the remains now extend over a large district in Essex and Suffolk, and attain a thickness, in some places, of not less than 40 ft. Prof. Henslow, in 1843, drew the attention of agricultural chemists to this deposit, as a source of materials for manure, and since then superphosphate manures have been manufactured from it to the value of many thousand pounds annually; a striking example of the valuable practical results which frequently flow from a purely scientific discovery.

CETRA'RO, a t. of s. Italy, in the province of Cosenza, situated on the Mediterranean, 24 m. n.w. of Cosenza. It has anchovy fisheries, and a population of 2,619.

CETTE, a seaport t. of France, in the department of Hérault, is built on a neck of land between the lagoon of Thau and the Mediterranean, in lat. 43° 24′ n., long. 3° 42′ east. The town, which is entered by a causeway raised above the Thau lagoon, and a bridge of 52 arches, is fortified, and the harbor is defended by a citadel and forts. The space inclosed by the piers and breakwater forming the harbor is about 30 acres, and has a depth of from 16 to 19 feet. A broad deep canal, lined with excellent quays, connects the port with the lake of Thau, and so with the Canal du Midi and the Rhone, thus giving to C. an extensive inland traffic; it has likewise an active foreign commerce. The principal trade is in wine, brandy, salt, dyestuffs, perfumery, and verdigris. C. has ship-building yards, and fisheries of oysters and anchovies. Pop. '76, 28,152.

CETTIGNÉ, or **CETINJÉ.** See Montenegro.

CETUS, or The Whale, the largest of all the constellations. It reaches from 0° to 25° s. declination, and from 0 to 2h. 30m. right ascention. Mira, a variable star, is the most conspicuous feature.

CEU'TA, a t. belonging to Spain, situated in the kingdom of Fez, on the n. coast of Africa, and opposite to Gibraltar, in lat. 35° 54′ n., and long. 5° 16′ west. It is strongly fortified, and defended by a citadel and forts erected on mount Hacho, the ancient *Abyla*, or south pillar of Hercules. It is the most important of the four Spanish *presidios*, or convict establishments, on this coast. The harbor is small and not very safe; and the population, which amounts to 8,200, is composed of Spaniards, Moors, Negroes, Mulattoes, and Jews, mostly very poor, and employed in trade and fisheries. Many of the Spaniards living here are state-prisoners, and even the garrison is partly manned by convicts. C., formerly called *Septa* or *Septum*, was taken from the Vandals in 534 by Justinian, who fortified the place anew. In 618, it fell into the hands of the western Goths; afterwards it was taken by the Moors, who held it until 1415, when it was captured by the Portuguese. It was annexed, with Portugal, to the crown of Spain in 1580, and was the only place on the African coast retained by Spain when Portugal was restored to its independence in 1640.

CEVADIL'LA. See Sabadilla.

CEVENNES (ancient *Cebenna*), the chief mountain range in the s. of France. With its continuations and offsets, it forms the water-shed between the river systems of the Rhone and the Garonne. Its general direction is from n.e. to s.w., commencing at the southern extremity of the Lyonnais mountains, and extending under different

local names as far as the canal du Midi, which divides it from the northern slopes of the Pyrenees. The central mass of the C. lies in the departments Lozère and Ardèche, Mont Lozère reaching an elevation of 4,884 ft., and Mont Mézen (the culminating point of the chain) an elevation of 5,794 feet. The average height is from 3000 to 4000 feet. The masses consist chiefly of amphibolic rocks, grauwacke, and limestone, covered with tertiary formations, which in many places are interrupted by volcanic rocks.

The C. has been celebrated as the arena of religious warfare. As early as the 12th c., the several sects known by the names, the "Poor of Lyon," the *Albigenses* (q.v.), and the *Waldenses* (q.v.), were known and persecuted in this district. After the revocation of the edict of Nantes by Louis XIV. in 1685, a series of cruel persecutions of the Protestants in the C. began, especially in 1697, after the peace of Ryswick. "Dragonnades" (q.v.) were employed to enforce the doctrines of the monks sent as missionaries into the heretical district. All persons suspected of Protestantism met with the most harsh and cruel treatment. Some of the inhabitants emigrated, others fled into the fastnesses of the mountains. Driven to desperation, the persecuted people at length rose to arms, and the murder of the abbé du Chaila, who was at the head of the dragonnades, gave the signal of a general insurrection in 1702. The insurgent peasants were styled *camisards* (q. v.) perhaps from *camise*, a smock worn by the peasantry. Headed by bold leaders, the most famous of whom were Cavalier and Roland, they defeated the troops sent against them by Louis again and again, until that king thought the insurrection of sufficient importance to require the presence of the distinguished general, marshal Villars; but he was recalled before the revolt had been put down, and it was left to the duke of Berwick to extinguish it in blood; the contest terminating in an entire desolation of the province, and the destruction or banishment of a great portion of the inhabitants. The embers of religious hatred still remained glimmering through the following century, and, after the restoration of the Bourbons in 1815, burst out into flames in the terrible persecution of the Protestants in Nîmes (q.v.) and other places in the s. of France. See *Histoire des Troubles des Cevennes* by Court de Gébelin (1760); Schulz's *Geschichte der Camisarden* (1790); Bray's *Revolt of the Protestants of the C.* (1870).

CEYLANITE. See SPINEL.

CEYLON' (the *taprobane* of the Greeks and Romans, and the *serendib* of the *Arabian Nights*), a valuable island and British colony in the Indian ocean, to the s.e. of the peninsula of Hindustan, from which it is separated by the gulf of Manaar and Palk's strait. Recent observations have shown its true place to be between 5° 55′ and 9° 51′ n. lat., and 79° 42′ and 81° 55′ e. long. Extreme length from n. to s., from Point Palmyra to Dondera Head, 271½ m.; greatest width, from Colombo to Sangemankande, 137½ miles. Area, including dependent islands, 24,454 sq. miles.

Physical Features.—In natural scenery, C. can vie with any part of the world; and as it rises from the ocean, clothed with the rich luxuriance of a tropical vegetation, it seems to the voyager like some enchanted island of eastern story. Its hills, "draped with forests of perennial green," tower grandly from height to height, till they are lost in clouds and mist. Near at hand, a sea of sapphire blue dashes against the battlemented rocks that occur at isolated points, and the yellow strands are shaded by groves of noble palms. In shape, C. resembles a pear, but its inhabitants more poetically compare it to one of their elongated pearls. Undulating plains cover about four parts of the island, and the fifth is occupied by the mountain-zone of the central s., which has an elevation of from 6,000 to 8,000 ft. above the sea-level. Pedrotallagalla, the highest mountain in the range, attains the height of 8,280 ft.; the celebrated mountain of Adam's peak, 7,420 ft.; and the table-land of Neuera Ellia, 6,210 feet.

Geology.—The mountain system is mainly composed of metamorphic rocks, chiefly gneiss, frequently broken up by intruded granite. With the exception of some local beds of dolomitic limestone, the gniess is everywhere the surface rock, and the soil is composed of its disintegrated materials. No fossils, as was to be expected, have been noticed in C., if we except the semi-fossil remains of mollusca, crustacea, and corals, belonging to living species, which occur in the rude breccias of the n. in the neighborhood of the sea. The northern part of the island is rising, and there also the land is making encroachments on the sea from another agency. The immense masses of corals continually increasing, retain the debris brought from the Indian continent by the currents of the sea, and thus form a flat, ever-increasing madrepore plain.

Of *metals and minerals*, iron, in the form of a carbonate, can be obtained in great quantities, and of such purity as to resemble silver. Tin is found in the alluvium at the base of the mountains, and on the heights the rare metal tellurium has been discovered. Nickel and cobalt are scarce. Anthracite and rich veins of plumbago exist on the southern range of hills. The *gems* of C. have been celebrated from time immemorial, and they are most plentiful in the alluvial plains at the foot of the hills of Saffragam. Sapphires, rubies, the oriental topaz, garnets, amethysts, cinnamon stone, and cat's-eye, are the principal gems and precious stones of the island. The most valuable is the sapphire; and one of these, found in the year 1853, was worth more than £4,000. The value of the precious stones annually found in the island is estimated at £10,000. The pearl fisheries of C. have long been famous, and since the beginning of the century are conducted directly for behoof of the government. But sometimes fishing operations

have to be suspended for a considerable period; thus there was no fishery from 1863, when the value obtained was £46,000, till 1874, when pearls worth £9,500, were secured.

Rivers.—The most important river in C. is the Mahawelli-ganga. It has its source in the vicinity of Adam's peak, and after draining more than 4,000 sq.m., it separates into several branches, and enters the ocean near Trincomalee. The s. side of the island is watered by 10 rivers of considerable size, which flow into the sea between Point de Galle and Manaar. On the e. coast, the rivers are smaller, but still more numerous, and many others traverse the northern and eastern provinces.

Harbors.—Point de Galle (q.v.) and Trincomalee (q.v.) are the two harbors of Ceylon. The former is small and dangerous, but the latter is unsurpassed as a safe and commodious port. The variation of the tides is very trifling; the rise and fall not generally exceeding 18 to 24 in., with a third of increase at spring-tides.

In *climate*, C. has a great advantage over the mainland of India, and as an island, enjoys a more equable temperature. The average for the year in Colombo (q.v.) is 80° in ordinary seasons. April is the hottest month; and in May the s.w. monsoon commences amid a deluge of rain, and continues the prevailing wind till Oct., when the n.e. monsoon sets in: 80 in. is the average annual fall of rain, though in an exceptional year, 120 in. have been registered. The beautiful table-land of Neuera Ellia was first visited by Europeans in 1826, and is now used as a sanatorium. Here the thermometer in the shade never rises above 70°, while the average is 62°; the nights are cool and refreshing. The n. of the island, including the peninsula of Jaffna, the plains of Neuera Kalawa, and the Wanny, may be reckoned as a third climatic division. Here the annual fall of rain does not exceed 30 in., and irrigation is largely employed in agriculture.

Flora.—The general botanical features of C., especially of the lowlands, are nearly identical with those of southern India and the Deccan, although it possesses a few genera of plants not to be found in those regions. Its phænogamic plants are limited to about 3,000. The beautiful ixoras, erythrinas, buteas, Jonesias, and other flowering shrubs bloom in the forests. At an elevation of 6,500 ft., the acanthaceæ cover large tracts of ground, and the tree-fern reaches the height of 20 feet. On the highest ground, rhododendron attain the size of timber-trees. The coral-tree (*eurythrina Indica*), the murutu (*lagerstræmia reginæ*), and the *Jonesia asoca* are amongst the most magnificent of the flowering trees. The fig tribe are planted in the vicinity of the temples. In the forests, climbing-plants and epiphytes of prodigious size and striking appearance cover the trees with a mass of parasitical foliage of extraordinary growth. The palmaceæ are very conspicuous in the vegetation of C., although not more than 10 or 12 species are indigenous: the cocoa-palm—of which it is estimated there are not less than 20 millions of trees—the taliput, the palmyra—which forms extensive forests in the n. of the island—and the jaggary palmare the most noteworthy. Of timber-trees, 416 varieties are known, and amongst these the satin-wood holds the first rank. The flora of the highlands, above 2,000 ft., and up to 6,000 or 7,000, though much resembling that of the Neilgherries, has a marked affinity to the vegetation of the highlands of Malacca and Java, especially the latter.

Fauna.—A knowledge of the fauna of C. has been greatly advanced by the labors of Drs. Templeton and Kelaart and Mr. Edgar Layard. *Quadrumanous* animals are represented by the *loris gracilis*, and five species of monkeys. Sixteen species of the *cheiroptera* or bat tribe, exist in C., and what is very remarkable, many of these rival the birds in the brilliancy of their colors. The *pteropus Edwardsii* (the flying-fox of Europeans) measures from 4 to 5 ft. from tip to tip of its extended wings. Of the larger *carnivora*, the bear and the leopard, and of the smaller, the palm-cat and the glossy genette (the civet of Europeans) may be mentioned. The dreaded tiger of India, the cheeta, the wolf, and the hyena are happily not met with in Ceylon. Deer, buffaloes, and the humped ox of India are amongst the *ruminantia;* the little musk-deer (*moschus meminna*) is less than 2 ft. in length. The *pachydermata* are represented by the elephant and the wild boar; the former, which is for the most part tuskless, is emphatically lord of the forests of Ceylon. The most remarkable of the *cetacea* is the dugong. Whales are captured off the coast; 320 species of *birds* have been ascertained by Drs. Templeton and Kelaart and Mr. Layard. The song of the robin and long-tailed thrush, and the flute-like voice of the oriole, are heard over the whole mountain zone, and far down into the neighboring plains. Eagles, the beautiful peregrine falcon, owls, swallows, king-fishers, sun-birds, bulbuls, crows, paroquets, pigeons, pea-fowl, jungle-fowl, and many others of the feathered tribe might be mentioned did space permit. Myriads of aquatic birds and waders, amongst which the flamingo is conspicuous, cover the lakes and lagoons. The crocodile is the largest reptile in the island; tortoises and lizards are also found. There are a few species of venomous snakes, and of these the ticpolonga and the cobra da capello are the most deadly.

Inhabitants.—The Singhalese, the most numerous of the natives of C., are the descendants of those colonists from the valley of the Ganges who first settled on the island 543 B.C. In their customs, costume, and general appearance, they have remained unchanged since the days of Ptolemy. The dress of the men, who have delicate features and slender limbs, is singularly effeminate, and consists of a *comboy* or waist-cloth, very much resembling a petticoat; their long hair, turned back from the forehead, is confined with combs, and ear-rings are worn by way of ornament. The women,

in addition to the comboy, cover the upper part of the figure with a white muslin jacket, and adorn themselves with necklaces, bangles, rings, and jewelry. The Singhalese are false and cowardly, but manifest a strong affection for their relatives, and a reverence for old age. Polyandry still lingers in the interior of C., and was formerly universal; it is now, however, chiefly confined to the wealthier classes, amongst whom one woman has often three or four husbands. The Kandyans, or Highlanders, are a more sturdy race, and maintained their independence for three centuries after the conquest of the low country by European settlers. The Malabars, or Tamils, have sprung from those early invaders of C., who from time to time swept across from southern Hindustan, and contended with the Singhalese kings for the sovereignty of the island. They have formed the chief population of Jaffna for full 2,000 years, and constitutionally excel the Singhalese and Kandyans. The Moormen, who are the most energetic and intelligent of the native communities, are met with in every province as enterprising traders. They are a very distinct race from the Singhalese, but have no tradition of their origin. Europeans generally believe them to be of Arab descent, but Tennent is of opinion that "they may be a remnant of the Persians, by whom the island was frequented in the 4th and 5th centuries,

The "burghers" of C. are a people of European descent, who have become naturalized. Those of Portuguese extraction hold the lowest place, and are mostly tradesmen and artisans; but the Dutch burghers frequently fill responsible posts, and are employed in the government offices.

Besides the races already alluded to, there is a remarkable tribe of outcasts—the Veddahs—hardly removed from the wild animals of the forest, and believed to be descended from the Yakkhos, the aboriginal inhabitants of the country. They occupy a district in the eastern part of the island, and have there preserved their ancient customs and manner of living unaltered for more than 2,000 years. They appear to be without the instinct of worship, and have no knowledge of a God. The tribe is divided into the *Rock Veddahs* and the *Village Veddahs*. The former hide themselves in the jungle, live by the chase, and sleep in trees or caves. They use fire to cook their meat, and their greatest gastronomic treats are the iguana lizard and roasted monkey. Their language —if the few words they make use of can be called by that name—is a dialect of the Singhalese. The Village Veddahs locate themselves in the vicinity of the European settlements, on the eastern coast, living in rude huts of mud and bark, and are hardly more civilized than their brethren of the jungles. The exertions of government to reclaim this harmless but degraded people have in some degree succeeded, and a promising colony has been formed.

Population.—Sir J. E. Tennent is of opinion that C., when in the height of its prosperity, must have been ten times as densely peopled as at the present day. In the official returns for the year 1881, the area and population of the six provinces of Ceylon are given as follows (total pop. in 1871, 2,405,287), North C., 60,000, not included.

Provinces.	Area in sq. miles.	Total population.	Pop. per sq. mile.
Western	3,345	897,329	198.11
North-western	2,805	293,327	76.54
Southern	1,927	433,520	183.69
Eastern	4,545	127,555	21.25
Northern	6,062	308,633	70.36
Central	5,770	639,361	64.37
Total	24,454	2,756,871	86.94
Military		1,658	.11
Total (including military)		2,758,529*	87.05

Religion.—The Singhalese are devoted to Buddhism (q.v.), which is the prevailing religion of the island. It does not exist, however, in that state of purity in which it is still found in the Indo-Chinese peninsula. Its sacred books are identical with those of Burmah and Siam, and both record the doctrines of Gautama in the Pali language; the deviations are in matters of practice. The Malabar kings adulterated Buddhism to a considerable extent with Brahmanism, introducing the worship of Hindu deities into the Buddhist temples, and this continues more or less to be the case. More than once have the Buddhists of C. sought to restore the purity of their faith—at one time sending deputies to Siam, at another to Burmah, with this object in view. The Burmah or Amarapura sect have long been the reformers of Singhalese Buddhism, and maintain no very friendly relations with the party, who, supported by the priests of Siam, acknowledge the civil power in matters of religion, sanction the worship of Hindu deities and the employment of the priesthood in secular occupations, uphold caste, and restrict the sacred books. Caste was acknowledged by the Singhalese prior to the introduction of Buddhism, which in principle is opposed to it; but so firmly was it rooted, that it still endures, though more as a social than a sacred institution. Gautama Buddha is said to

* Including 4,836 British and 17,866 whites of European descent.

have visited C. three different times to preach his doctrine, and his *Sri-pada*, or sacred footstep, on the summit of Adam's Peak (q.v.), still commands the homage of the faithful. Buddhism was not, however, permanently introduced into C. till 307 B.C., when Mahindo, obtaining the support of the king, established it as the national faith. The influence of the priests gradually increased, and, by the piety of the Singhalese kings, monasteries were richly endowed; for though the Buddhist monk is individually forbidden to possess goods, a community may own property to any extent; and it is a remarkable fact that, at the present day, no less than one third of the cultivated land of the island is computed to belong to the priesthood, and is exempt from taxation. The priests of C. are divided into two orders—the *Samanaros*, and those who, after a time of probation, receive the higher grade of *Upasampada*. The fraternity are not raised by education above their countrymen, and the respect paid them is directed more to the dress than to the person of the individual. Any member is at liberty to lay aside his ascetic character, and return to a secular life. The most celebrated Buddhistic relic in C. is the *Dalada*, or sacred tooth of Gautama, at Kandy, which is guarded with jealous care, and preserved in an elegant shrine; but it is well known that the original relic was destroyed by the Portuguese, and the present substitute is a piece of discolored ivory, bearing no resemblance to a human tooth. In all Buddhist countries, the sacred buildings present, with certain modifications, the same general character (see articles BUDDHISM, BURMAN, etc.); and in C. we find the three classes represented by the dagoba, or relic-shrine (*datu*, a relic, and *gabbhan*, a shrine), the temple proper, and the vihara or monastery. The labor bestowed on these edifices in the early ages of the Singhalese monarchy is truly astonishing. In the n. of the island, ruined cities—buried for ages in the depths of the forest—have been discovered, revealing monuments that in dimensions may almost compare with the pyramids of Egypt. The most remarkable of these vestiges of an early civilization is Pollanarrua, the ancient capital of C.; and here is the celebrated *Gal-wihara*, a rock-hewn temple, supposed to be "the only example in Ceylon of an attempt to fashion an architectural design out of the rock, after the manner of the cave-temples of Ajunta and Ellora." The reclining figure of Gautama is 45 ft. in length, the upright one measures 23 ft.; and the sitting image on the left is 16 ft. from the altar to the top of the head. The cave-temple of Dambool was built 100 B.C., and is the most celebrated in the island. The bell-shaped tapering dagobas of C., as relic-shrines, answer to the pagodas of Burmah—which they very much resemble—and the topes of Afghanistan. The ruins of the Jaytawanarama dagoba still reach the height of 249 ft.; its diameter is 360 ft.; and from base to pinnacle it is covered with trees of the largest size. This enormous structure contains 20 millions of cubical ft.; and sir J. E. Tennent concludes that to erect such a mass of masonry, even in the present day, "would occupy 500 bricklayers from six to seven years," at the cost of a million sterling. The Ambustella of Mihintala is another remarkable dagoba. A very famous object in connection with Buddhism in C. is the sacred Bo-tree of Anarajapoora (*peepul, ficus religiosa*), which was planted there 288 years B.C., and is by far the oldest tree in the world of which an authentic history exists. See BO-TREE. Amongst the antiquities of C. must be mentioned those wonderful monuments of the former greatness of the Singhalese people—the ruined tanks; with which almost nothing of a similar kind, whether ancient or modern, can be compared; 30 colossal reservoirs, and about 700 smaller tanks, still exist, though for the most part in ruins. The restoration of these magnificent works of irrigation has recently been begun. Brahmanism or Hinduism (q.v.) is the faith of the Tamils or Malabars, but the Moormen are Mohammedans. After the expulsion of the Dutch Christians, Protestant missions to the natives of C. were commenced by the Baptists in 1813. The Wesleyan Methodists followed in 1814, the Americans in 1816, the church of England in 1818, and Christian instruction has made some progress amongst the native populations. Of these the peasantry of the Kandyan hills have proved the least accessible to its influence. Schools, collegiate institutions, and female seminaries, under the direction of the missionaries, are in successful operation.

Government.—The administration of C. is vested in a governor, who is assisted by an executive council of five members, and a legislative council of fifteen members. The governor's salary is £7,000 per annum. In 1876 the revenue was £1,375,888, and the expenditure £1,276,930. The chief items of revenue are the customs, averaging £286,000; licenses, £150,000; sales and rents of public lands, £230,000. The colony made very great progress under the able administration of sir H. Ward. The civil and judicial establishments of the colony cost nearly £300,000.

The following are the trade returns for the five years 1870 to 1874:

Years.	Imports.	Exports.	Exports from Ceylon to the United Kingdom.	Imports of British Home Produce into Ceylon.
1870.....	£4,634,297	£3,803,730	£3,450,974	£908,415
1871.....	4,797,592	3,634,853	3,167,673	928,807
1872.....	5,169,524	3,139,060	3,163,153	1,017,753
1873.....	5,574,358	5,439,591	4,331,006	1,052,072
1874.....	5,691,860	4,687,388	3,600,492	1,158,283

The value of the staple coffee exported from Ceylon to the United Kingdom was, in 1867, £2,814,060; in 1869, £2,867,724; in 1871, £2,623,263; in 1872, £2,341,601; in 1873, £3,692,333; and in 1876, £2,550,688. In 1876, cocoa-nut oil valued at £236,856, and cinnamon at £119,700, were exported to the United Kingdom. To the ancient world, C. was famous as a place of traffic. Egyptians, Greeks, Romans, Persians, and Arabians traded to its ports; and many particulars, such as geographical position and natural productions, seem to identify Point de Galle with the Tarshish of the Hebrew historians.

The *history* of C., of which the limits of this article will only allow the briefest possible outline, may be conveniently divided into ancient and modern, and the latter into the Portuguese, Dutch, and British periods.

The records of its early history came to light in 1826, and Mr. Turnour, devoting himself to their study, composed an *Epitome of the History of C.*, from the year 543 B.C. to 1798 A.D.; and he records the reigns of 165 kings, who reigned during this space of 2,341 years. The most famous of the Singhalese books is the *Mahawanso*, a metrical chronicle, in the Pali language, which gives an account of the island during the above 23 centuries. The story begins with the invasion of Wijayo (543 B.C.), son of a petty Indian sovereign in the country watered by the Ganges. He subdued the Yakkhos, the aboriginal inhabitants; married a daughter of one of the native chiefs, whom he subsequently repudiated for an Indian princess; and founded a dynasty that held undivided sovereignty in C. for nearly eight centuries. He bestowed on his kingdom his patrimonial name of Sihala (whence Singhalese, Ceylon), and promoted the settlement of colonists from the mainland. In the reign of king Devenipiatissa (307 B.C.), Buddhism was established as the national religion, and his reign was further remarkable by the planting of the sacred bo-tree, 288 B.C.; and now commenced the erection of those stupendous buildings already noticed. The next important epoch in Singhalese history is the usurpation of the Malabars (237 B.C.), foreign mercenaries from the Coromandel coast, to whom the native sovereigns had intrusted the defense of the island. Several Malabar invasions are chronicled in the history of C., and these foreigners long contended with the native princes for supreme authority. Passing on to 1071 A.D., a native dynasty was then re-established in the person of Wijayo Bahu, which, for 100 years, delivered the country from the dominion of the Malabars. Prakrama Bahu commenced a reign, in 1153, the most renowned in the records of Ceylon. He devoted himself to religion and agriculture, and besides many notable religious edifices, he caused no less than 1470 tanks to be constructed, subsequently known as the "seas of Prakrama." Thirty years after the death of this monarch, the Malabars landed with a large army, and speedily conquered the whole island. In 1235, a native dynasty recovered a part of the kingdom. During the reign of Dharma Prakrama IX. the Portuguese first visited C., 1505; but it was in 1517 that they first formed a permanent settlement at Colombo for trading purposes. Their encroachments soon raised the patriotic Kandyans, and it is a remarkable fact, that though at the first visit of the Portuguese in 1505 they were even ignorant of the use of gunpowder, they, after a while, excelled their enemies as musketeers, and were finally able to bring 20,000 stand of arms to bear against them. "Amity, commerce, and religion," was the Portuguese motto; but their rule in C. is a sad story of rapacity, bigotry, and cruelty. They were at last driven from the island by the Dutch in 1658, after a contest of 20 years, when, as sir J. E. Tennent remarks, "the fanatical zeal of the Roman Catholic sovereign for the propagation of the faith, was replaced by the earnest toil of the Dutch traders to intrench their trading monopolies; and the almost chivalrous energy with which the soldiers of Portugal resisted the attacks of the native princes, was exchanged for the subdued humbleness with which the merchants of Holland endured the insults and outrages perpetrated by the tyrants of Kandy upon their envoys and officers." But the purely military tenure of the Dutch was destined to give place to the colonization of the British. It was during the great European war succeeding the French revolution, that the English gained possession of the island. On the 1st Aug. 1795, an expedition under col. James Stuart landed at Trincomalee, which was speedily captured, and finally the garrison of Colombo surrendered on the 16th Feb. 1796. By this capitulation all the Dutch settlements and strongholds in C. were ceded to the English; though the island was not formally annexed to the British crown till the peace of Amiens, 27th Mar. 1802. The native sovereigns, however, continued in the possession of their mountain territory; but at length the Kandyan king, Wikrama Raja Singha, after perpetrating the most frightful atrocities on his own people, seized and murdered certain native merchants, British subjects, trading to Kandy. War followed, Jan. 1815; Kandy was taken, and the tyrant sent a captive to the fortress of Vellore. On the 2d Mar. 1815, a treaty was concluded with the native chiefs, by which the king was formally deposed, and his territories annexed to the British crown.

Since then, the island has made rapid strides in material prosperity. The mountain-forests have been replaced by plantations of coffee, of which there are now about 500 under cultivation, of 150,000 acres, giving an average crop of 950,000 cwts. per annum. Many important public works have been completed, and others are still in progress. Several good roads have been constructed, including a magnificent mountain-road between Colombo and Kandy, and there is a railway 92 m. in length. In 1874, there were 243 government schools, with 11,719 pupils; 882 mission schools, with 44,449 pupils; and 329 private schools, with 9,929 pupils.

See *Ceylon, Physical, Historical, and Topographical*, etc., by sir James Emerson Tennent (Lond. 1859); *Christianity in Ceylon*, by the same author (Lond. 1850); *The Statesman's Year-book* for the current year; and *Ceylon, a General Description of the Island*, by an officer, late of the Ceylon rifles (1876); *Ceylon*, by Haeckel, '83, and by J. Ferguson.

CEYLON, *ante.* The Cinghalese, or Singhalese language is spoken in the interior and on the s. coast of the island of Ceylon. It is a modification of the aboriginal Ebu by the Sanskrit, with a tinge of Malay. The Cinghalese has so far degenerated that there is now a material difference between the vernacular and the written language. The former is copious and has a regular grammar. There are 50 letters, 8 vowels, 8 diphthongs, and 34 consonants, but all representing only 30 sounds, 7 vowels and 23 consonants. In literature the language has several original poems of some merit, and an extensive and interesting series of native chronicles, but the most valuable literature is written in Pali. This Pali is one of the Prakrits of ancient India, "which was spoken in the 6th c. before Christ, and has been a dead language for upwards of 2,000 years."

CEYX. See KINGFISHER.

CEZIM'BRA, a coast t. of Portugal, in the province of Estremadura, about 18 m. s. of Lisbon. C. has active fisheries, and a pop. of 5,000.

CHABAS, FRANÇOIS JOSEPH, b. 1817. He has devoted himself especially to Egyptian archæology, in which he is considered among the highest authorities. His principal works are *Le Papyrus Magique Harris; Voyage in Egypt and Syria; Les Pasteurs en Egypte,* and *Studies in Ancient History.*

CHABLAIS, an old division of the province of Annecy in Savoy, now the arrondissement of Thonon, France; 356 sq.m.; pop. 60,193. It once formed a part of the kingdom of Burgundy. Under the French empire it was a part of the department of Leman; in 1814, its possessions went to Sardinia, and in 1860, with all of Savoy, it was given over to France.

CHABLIS, a village in France, dep. of Yonne, which gives name to a much esteemed white Burgundy (q.v.) wine

CHABOT, PHILIPPE DE, d. 1543; a French general, brought up with Francis I. He defended Marseilles in 1524, but the next year was made prisoner at Pavia. He was subsequently made admiral, and in 1535 commander in chief. He was said to have been the first to suggest the colonization of Canada. There is a monument to him in the Louvre.

CHA'BRIAS, an Athenian gen. who assumed command about 392 B.C. He defeated the Spartans at Ægina in 388, and again at Naxos in 376. He commanded with Iphicrates and Callistratus at Corcyra, and repulsed Epaminondas before the walls of Corinth. In 366, he was accused of treachery in advising the surrender of Oropus to the Thebans, and was defended by Plato. At the commencement of the social war, in 357, he joined Charos in the command of the Athenian fleet. At the siege of Chios his ship was disabled, but he refused to retire, and was killed while fighting. C. was famous for inventing a new style of receiving a charge, which was on the left knee, the shield resting on the ground, and the spears pointed at the enemy.

CHACHAPOY'AS, or SAN JUAN DE LA FRONTERA, a t. in the department of Amazonas, Peru, 410 m. w. of Lima; pop. 6,000. It is on a tributary of the Maranon, in a rich agricultural region.

CHAC'MA. See BABOON.

CHACO, EL GRAN, a large and little explored country in South America, about the middle of the continent. The n. portion is well watered and densely wooded, with intervals of grassy plains and marshes, and capable of producing nearly all tropical vegetation. The s. portion is for the most part a desert and can be cultivated only after irrigation. The n. portion belongs to Bolivia, while the s. is occupied almost entirely by Indians.

CHAD, SAINT, bishop of York, in the 7th century. He was educated under Aidan at Lindisfarne. At his death he held the see of Litchfield. His day is Mar. 2.

CHADBOURNE, PAUL ANSEL, D.D., LL.D., b. Me., 1823; professor of natural history and chemistry in Williams college and in Bowdoin college, and in 1867, chosen president of the university of Wisconsin, at the same time becoming professor of metaphysics. In 1872 he was elected president of Williams college, and resigned in 1880. He was author of *Natural Theology*, and *Instinct in Animals and Men.* 1883.

CHAD'DA. See BENUWE.

CHADWICK, EDWIN, C.B., a distinguished social and sanitary reformer of the present day, born in the vicinity of Manchester, 24th Jan., 1801. He studied law, but early devoting his attention to questions of social, sanitary, and political science, he attracted the notice of lord Grey's government, by whom he was appointed an assistant-commissioner to inquire into the operation of the poor-laws in England and Wales. His report, published with others in 1833, commanded most attention, being remarkable alike for the wide and searching character of its investigations, the happiness of its illustrations, and the convincing proofs it furnished as to the necessity of reform in the system of

administration. Its merit was recognized by those who had the power to reward him; and on the organization of the new poor-law board, C. was appointed secretary. In connection with this board, and the general board of health, C. for twenty years was energetic in the origination and administration of remedial measures relative to the distribution of poor-law funds, and to the sanitary condition of the country. He has also given much attention to the constitution of the constabulary force, with a view to the better prevention of offenses and the readier detection of criminals. On a change being made in the board of health, in 1854, C. retired with a pension. He has since taken great interest in promoting competitive examinations for government offices, and indeed in almost all questions of social economy. He has been an active member of the association for the promotion of social science. In 1859–60, he collected evidence for the education commission.

CHADWICK, John White. See page 892.

CHÆRONEI'A, a city of Bœotia, in ancient Greece, near the Cephissus, on the borders of Phocis. It is celebrated on account of several important battles fought in the neighborhood. In 447 B.C., the Bœotians here obtained a victory over the Athenians; and in 338 B.C., Philip of Macedon signally defeated the united forces of the Athenians and Bœotians, and so crushed the liberties of Greece. A mound of earth, about a mile from the modern village of Kapurna, which occupies the site of the old city, still marks the place where the Thebans who fell in the battle were buried; and a magnificent lion, which col. Mure pronounced to be "the most interesting sepulchral monument in Greece," was excavated from this tumulus some years ago. At C., also, 86 B.C., Sulla defeated the generals of Mithridates. Plutarch was a native of this town. A few ancient remains yet exist.

CHÆTODON'TIDÆ, a family of acanthopterous fishes, nearly corresponding to the genus chætodon (Gr. hair-tooth) of Linnæus; and also named Squamipennes (Lat. scaly-finned), because of the most distinctive character of the family, the incrustation of the soft portions of the dorsal and anal fins, and often of the spinous parts also, with scales, the fins appearing to taper gradually out of the thickness of the body, which is in general remarkably compressed, so that, without dissection, it is impossible to tell where they begin. The scales are strongly ctenoid (q.v.). The typical genus *chætodon*, and those most nearly allied to it, have hair-like teeth, so that their jaws resemble brushes; some fishes of the family, however, have trenchant teeth on the jaws, and some, as *brama* (q.v.), have card-like teeth both on the jaws and palate. Most of the C. are tropical; only one species, *Brama raii*, is ever found in the British seas. They generally frequent rocky shores. Their colors are often extremely gay, and usually disposed rather in stripes or bands than in spots. "The eye of man receives the greater pleasure from their contemplation, in that, being of moderate or small size, and haunting habitually the coral basins of the transparent tropical seas, they disport themselves in the beams of a vertical sun, as if desirous of exhibiting their splendid liveries to the greatest advantage in the blaze of day." Many singularities of form occur in this family, as the long slender snout of the *chelmons*, the whip-thong-like prolongation of some of the rays of the dorsal fins in *heniochus* and *zanclus*, the wing-like dorsal and anal fins of *platax*, the sharp recurved horns of the buffalo-fish (*taurichthys*), etc. To this family belong the archer-fishes (q.v.), whose singular habits have been already noticed. The flesh of most of the C. is of very fine flavor.

CHAF'ER, a common name of those beetles or coleopterous insects, which either in the perfect or larva state, are destructive to plants; particularly those which devour the wood, bark, or roots of trees. From these, however, it is sometimes extended to some coleopterous insects which have no such habit. The word C. is seldom used alone, but generally as part of a name, with some prefix; thus, we have *cock-chafer*, *rose-chafer*, *bark-chafer*, etc.

CHAFF-CUTTER, a name commonly given to an implement now much used by farmers for cutting hay and straw into half-inch lengths. The advantage of this consists not so much in facilitating mastication or digestion, as in preventing animals from wasting their food. No small amount of mechanical ingenuity has been applied to the construction of chaff-cutters, the simplest and oldest kinds of which are mere hand-machines with a single large knife, the hay or straw being pushed forward in a trough or box, whilst others are driven by horse, steam, or water power, and are complicated.

CHAFFEE: co. Col. See page 892.

CHAFFEE, Jerome B. See page 892.

CHAF'FINCH, *Fringilla cœlebs*, one of the most common British birds, a species of finch (q.v.), and probably that to which the name finch, now so extended in its signification, originally belonged; *fink*, the German form of the name, and *pink* and *twink*, English provincial forms still appropriated to the C., having some resemblance of sound to its common call-note. The whole length of the C. is about 6 inches. The tail is very slightly forked. The male, in summer, has the top of the head and nape of the neck bluish-gray; the back, chestnut; the wings almost black, with two conspicuous white bars; the tail, nearly black. The colors of the female are much duller than those of the male. The C. is a very widely distributed species, being found in almost all parts of Europe, in some parts of Asia, in the n. of Africa, and as far w. as the Azores. In the colder northern countries, it is migratory; in more southern regions, it is station-

ary. Linnæus gave it the specific name *cœlebs*, from observing that the flocks congregated in winter in Sweden consisted chiefly of males, the females having, as he supposed, sought a milder climate. A partial separation of the sexes is observed also in the great winter-flocks in Britain, but it is only partial; and Yarrell thinks that the young males of the previous season, which resemble the females in plumage, are associated with them, and have been mistaken for them. The flocks seen in Britain in winter are believed to be augmented by migration from Scandinavia. The eggs are usually 4 or 5 in number, of pale purplish buff color, sparingly streaked and spotted with reddish brown. The C. feeds chiefly on insects, and does much service in summer by destroying aphides and caterpillars; but eats also seeds, and is sometimes persecuted, because in spring it pulls up and eats young turnips and radishes when in the seed-leaf. Great numbers of chaffinches are killed for the table in Italy. In Germany, this bird is in the highest esteem as a song-bird. Its notes are very clear and loud, but some individuals greatly excel the ordinary multitude of their species; and their superior notes, if heard on the Thuringian hills, speedily attract bird-catchers. Bechstein says that, in Thuringia, a cow has been given for a C. with a fine voice; and the Germans have taken the trouble to classify the different strains of chaffinches, giving them distinct names, and regarding those birds as particularly valuable by which certain of these strains are produced.—The common Scotch name of the C. is *shilfa*.

CHAGRES, a river entering the gulf of Darien on the n. side of the isthmus of Panama, near lat. 9° 18′ north. Though, towards its mouth, it varies in depth from 16 to 30 ft., it is yet, by reason at once of its rapidity and its falls, but little available for navigation. At its entrance is a port of its own name. Both the town, however, and the stream have recently lost nearly all the advantages of their position, through the establishment of an inter-oceanic railway, which, on the Atlantic side, commences at Aspinwall, about 8 m. to the north.

CHAILLÉ–LONG, Charles. See page 892.

CHAILLU, Paul B. DU. See Du Chaillu.

CHAIN, in surveying (called Gunter's chain, from its inventor), is a measure of 22 yards long, composed of 100 iron links, each of which is thus 7.92 in. long. As an acre contains 4,840 sq. yards, 10 sq. chains ($22\times22\times10=4{,}840$ sq. yards), or 100,000 sq. links, make an acre.

CHAIN-BRIDGE. See Suspension Bridges.

CHAIN-CABLE. See Cable.

CHAIN-MAIL, or Chain-Armor, much used in the 12th and 13th centuries, consisted of hammered iron links, connected one to another into the form of a garment. Such armor was much more flexible and convenient to the wearer than that which was formed of steel or brass plates, but was less fitted to bear the thrust of a lance.

CHAINS, on shipboard, are strong iron links or plates, bolted at the lower end to the ship-timbers, and having a block or *dead-eye* at the upper end. Their purpose is to fasten down the shrouds tightly. They are brought out laterally at the top by resting in the middle against the channels, which are broad thick planks, very strongly fixed, and projecting horizontally from the side of the ship, one pair for each mast.

CHAINS, Hanging in. In atrocious cases, it was usual for courts of justice, in former times, to direct the bodies of malefactors, after execution, to be hung in C. upon a gibbet near the spot where the crime was committed; but this, says Blackstone, "was no part of the legal judgment." The reasons commonly assigned for the practice are two: first, that it might strike terror into other offenders; and second, that it might afford "a *comfortable* sight to the relations and friends of the deceased." This barbarous adjunct to capital punishment was not finally abolished till a very recent period, and it may surprise our readers to learn that, two years after the passing of the reform bill, it was still in accordance with the law, if not with the custom of England. The act "to abolish the practice of hanging the bodies of criminals in chains" (4 and 5 Will. IV. c. 26), was passed on 25th July, 1834. The last case of hanging in C. mentioned as having occurred in Scotland, is that of Andrew Wilson, who poisoned his wife in 1755 (Hume, vol. ii. p. 482). See Punishments and Dissection.

CHAIN-SHOT, a nearly obsolete kind of ammunition, chiefly used in naval warfare, consisting of two balls connected by a short chain. The object of the chain is to destroy the rigging, etc., which otherwise might escape. As grape-shot has been found to serve the same end, the making of chain-shot has been discontinued.

CHAIN SNAKE, or King Snake, an American serpent, haunting moist or shady places, and feeding upon mice, moles, small birds, and reptiles. It is remarkable for the beauty of its colors, the ground work on the upper part of the body being a lustrous black, while the scales are marked with white spots. The head is very small.

CHAIX D'EST ANGE, Gustave Louis Victor Adolphe Charles. See page 892.

CHAJUG, or CHIUG, Jehuda ben-David, b. about 1030; regarded by Jewish critics as the first of Hebrew grammarians. He made some very remarkable and valuable discoveries in philology.

CHALA'ZA, in botany, a membrane which unites the nucleus and integuments at the base of an ovule. It is traversed by vessels which supply nourishment to the ovule. It is often of a different color from the rest of the integuments, and is conspicuous in the

ripened seed; but it is sometimes difficult to distinguish it, particularly in *orthotropal* seeds, when it is in contact with the *hilum*, the *foramen* or *micropyle* being at the opposite extremity of the seed. See OVULE and SEED.

The cords which bind the yolk-bag of an egg to the lining membrane at the two ends of the shell, and keep it near the middle as it floats in the albumen, are also called *chalazæ*. They appear to be formed of a peculiarly viscid albumen.

CHALCE'DON, a city of ancient Bithynia, at the entrance of the Euxine, opposite to Byzantium. It was founded 684 B.C. by a colony from Megara, and soon became a place of considerable trade and importance. It contained several temples, one of which, dedicated to Apollo, had an oracle. C. was taken by the Persians, suffered the vicissitudes of war during the strife for Grecian supremacy between the Athenians and Lacedemonians, and finally merged into the Roman empire. During the Mithridatic war, it was the scene of a bold exploit of the Pontic sovereign. Having invaded Bithynia, all the wealthy Romans in the district fled for refuge to C., whereupon he broke the chains that protected the port, burned four ships, and towed away the remaining sixty. Under the empire it was made a free city, and was the scene of a general council, held 451 A.D. Chosroes the Persian captured it 616 A.D., after which it declined, until it was finally demolished by the Turks, who used its ruins to build mosques and other edifices at Constantinople. C. was the birthplace of the philosopher Xenocrates.

The *council* of C., to which allusion has been made, was the fourth universal council, and was assembled by the emperor Marcian for the purpose of drawing up a form of doctrine in regard to the nature of Christ, which should equally avoid the errors of the Nestorians (q.v.) and Monophysites (q.v.). Six hundred bishops, almost all of the eastern or Greek church, were present. The doctrine declared to be orthodox was, that in Christ there were two natures, which could not be intermixed (this clause was directed against the Monophysites), and which also were not in entire separation (this was directed against the Nestorians), but which were so conjoined, that their union destroyed neither the peculiarity of each nature, nor the oneness of Christ's person.

CHALCE'DONY (often misspelled *calcedony*), a beautiful mineral of the quartz family, or rather a variety of quartz, from which it does not differ in chemical composition or in any essential character. It derives its name from Chalcedon in Bithynia, near which it is found in considerable abundance, and has been known by the same name from ancient times. It occurs in different kinds of rock, but most frequently in old lavas and trap-rocks, and is found in almost all parts of the world where these exist, or where there are boulders derived from them. It is common in Scotland, and specimens of great beauty are brought from Iceland and the Faröe islands. It never occurs in crystals. It constitutes the whole or the principal part of many agates. It is generally translucent, sometimes semi-transparent, has not much luster, and is in color generally white or bluish white, sometimes reddish white, sometimes milk-white, less frequently gray, blue, green, yellow, brown, or even black. Its fracture is even, or very slightly conchoidal. —C. is much used in jewelry, for brooches, necklaces, and ornaments of all sorts, the largest pieces being sometimes made into little boxes, cups, etc. It was much used by the ancients, and many beautiful engraved specimens appear in antiquarian collections. Chalcedonies with disseminated spots of brown and red, were once very highly prized, and were called *stigmites* or *St. Stephen's-stones*. Petrified plants are sometimes found in C., in which they appear to have been encased whilst it was in course of formation. Specimens of C. are sometimes found enclosing a little water in the interior, which gives them a very beautiful appearance; but the water easily escapes, to prevent which, rings or other ornaments made of such stones are kept in distilled water, when not worn. The ancients set a very high value on these *enhydrites* (Gr. *en*, in, and *hydor*, water). The Vincentin was celebrated for producing them.

CHALCED'ONYX (or, erroneously, *calcedonyx*), a name given to agates formed of cacholong, or a white opaque chalcedony, alternating with a grayish translucent chalcedony.

CHALCHIHUITL, a stone held in great repute by the ancient Mexicans, and still by the Indians of that country, who fashion it into ornaments and occasionally use it in trade. It is a turquoise found in the mountains not far from Santa Fé. The mines were exhausted before the coming of the Spaniards. The stone was valued by the Mexicans more highly than gold.

CHAL'CIS, a genus of Saurian reptiles, the type of a family called *chalcidæ*, some of which are popularly termed snake-lizards, because of the resemblance to snakes in the elongated form of the body, the limbs being also remarkably small, so that this family forms one of the transition links between the Saurian and the Ophidian reptiles. The scales are rectangular, and arranged in transverse bands, without being imbricated or disposed like tiles. The *chalcidæ* are natives of warm climates, both in the old and new worlds.

The name C. has also been bestowed on a genus of the order *hymenoptera*, allied to the ichneumons, which has become the type of a tribe or family, containing a vast number of species—1500 being supposed to exist in Britain—all of them of small size, many very minute, many of them very brilliant in their colors, and the larvæ of all of them parasitic

in the larvæ or pupæ, some even in the eggs, of other insects. The chrysalis of a butterfly or moth often nourishes a great number of these parasites; and they become useful in preventing the excessive multiplication of species which destroy valuable plants.

CHAL'CIS, the capital t. of the island and government of Eubœa, Greece, situated on the Euripus, a strait separating the island from Bœotia, and which at this point is only 120 ft. wide. The Euripus is divided into two channels, of unequal breadth and depth, by a rock, which is surmounted by a castle, partly of Venetian and partly of Turkish construction. A stone bridge, of some 70 ft. in length, connects the rock with the Bœotian shore, while a wooden and movable bridge, of about 35 ft., unites it with Chalcis. C. is a place of very great antiquity, having been founded, as tradition asserts, before the Trojan war, by an Ionian colony from Athens. Its rise was rapid. It sent out numerous colonies, and was the center of the trade of the western Mediterranean. Governed at first by an aristocracy, it fell into the hands of the Athenians, who in 506 B.C. divided the lands of C. amongst some of their own number. It subsequently fell under the power of the Macedonians and Romans, and was at this time a place of great military importance, nearly 9 m. in circumference, and had many fine temples, theaters, and other public buildings. Aristotle died at Chalcis. In the middle ages, it was prosperous under the Venetians, who held it for nearly three centuries, until its conquest by the Turks in 1470. The lion of St. Mark is, or was until within recent years, still to be seen over the gateway between the bridge and the citadel. Not many ancient remains now exist at Chalcis. The streets are narrow, but the houses, many of which owe their origin to the Venetians, are substantial and spacious. Pop. '70, 6,447.

CHALCOG'RAPHY, a pedantic term used to signify engraving on copper, compounded of the Greek words *chalkos*, brass or copper, and *grapho*, I write. The term is inaccurate when applied, as it often is, to engraving on other metals, such as steel and zinc. For zinc-engraving the still more objectionable word *zincography* has been invented.

CHALDÆ'A. See BABYLON, BABYLONIA.

CHALDÆ'AN CHRISTIANS, a branch of Nestorians who acknowledge the pope of Rome. They use the eastern rite, and are under the patriarch of Babylon. They are supposed to number about 70,000. See NESTORIANS.

CHAL'DEE. See ARAMÆA.

CHALDER, an old Scotch dry measure, containing 16 bolls. See BOLL.

CHALDRON (Lat. *caldarium*, a vessel for warm water), an old dry measure used in selling coal, and containing 36 heaped bushels. Coal is now sold by weight.

CHALEUR BAY, an inlet of the gulf of St. Lawrence, between Gaspé, a district of Lower Canada, and New Brunswick, having a depth of 90 m. from e. to w., and a width varying from 12 to 20. The Restigouche, which enters the gulf from New Brunswick at its very head, marks, at its mouth, the interprovincial boundary.

CHALEURS, BAY OF, a westward extension of the gulf of St. Lawrence, separating New Brunswick from Quebec. It is nearly 100 m. long, and varies in width from 10 to 22 miles. It is navigable in all parts, and is much resorted to for its mackerel fisheries.

CHALICE (Lat. *calix*, a cup). This ancient name for an ordinary drinking-cup has been retained for the vessels used for the wine in the holy sacrament. Chalices are commonly made of silver, but it was not unusual for them to be of gold, or gilt and jeweled. Chalices were also made of glass, crystal, and agate; but these substances have been abandoned, in consequence of their fragile nature. The C. is the attribute of St. John the evangelist.

CHALK, a soft earthy variety of limestone or carbonate of lime, forming great strata, and claiming the attention of the geologist even more than of the mineralogist. It is generally of a yellowish-white color, but sometimes snow-white. It is easily broken, and has an earthy fracture, is rough and very meager to the touch, and adheres slightly to the tongue. It generally contains a little silica, alumina, or magnesia, sometimes all of these. Although often very soft and earthy, it is sometimes so compact that it can be used as a building-stone; and it is used for this purpose either in a rough state, or sawn into blocks of proper shape and size. It is burned into quicklime, and nearly all the houses in London are cemented with mortar so procured. The siliceous particles being separated by pounding and diffusing in water, it becomes whiting, of which the domestic uses are familiar to every one. Carpenters and others use it for making marks, which are easily effaced: the *blackboard* and piece of C. are now common equally in the lecture-rooms of universities and in the humblest village-schools. C., perfectly purified, is mixed with vegetable coloring matters, such as turmeric, litmus, saffron, and sap green, to form pastil colors; but vegetable colors which contain an acid are changed by it. See CRAYON. The *Vienna white* of artists is simply purified chalk. In a perfectly purified state, it is administered as a medicine, to correct acidity in the stomach. C. is also extensively used as a manure. See LIME, as a manure.

CHALK, BLACK, is a mineral quite different from common chalk, and apparently receives its name from resembling it in meagerness to the touch, in soiling the fingers,

and in being used for drawing, writing, etc. It is also called DRAWING-SLATE. It is of a slaty structure, of a bluish or grayish-black color, easily cut and broken, and makes a perfectly black mark on paper. It is used for drawing, and as a black color in painting. It becomes red by exposure to heat. It is essentially a kind of clay (q.v.), and derives its color from carbon, which it contains. It is found in primitive mountains, in Spain, France, Italy, etc., also in the coal formation in Scotland.—BRIANÇON CHALK and FRENCH CHALK are popular names for soapstone (q.v.).—RED CHALK is *ochery red clay-iron-ore*, consisting of clay and much peroxide of iron. It is of a brownish-red color, and a somewhat slaty structure, the cross fracture earthy. The coarser varieties are used chiefly by carpenters for making marks on wood; the finer, by painters. It occurs in thin beds in clay-slate and grauwacke-slate in some parts of Germany.

CHALK-BEDS. See CRETACEOUS GROUP.

CHALKING THE DOOR, a mode of warning tenants to remove from burghal tenements, long known and still in use in Scotland. The practice is thus described by Mr. Hunter in his valuable work on Landlord and Tenant: "A burgh-officer, in presence of witnesses, chalks the most patent door forty days before Whitsunday, which is held to be a legal warning. There is no execution at the parish church, but the officer makes out an execution of 'chalking,' in which his name must be inserted, and which must be subscribed by himself and two witnesses. This ceremony now proceeds simply on the verbal order of the proprietor, but anciently the interposition of a judge was requisite. In such a case, authority was given by one of the magistrates to the burgh-officer." That judicial authority is still assumed to lie at the root of the proceeding, is apparent from the fact that the execution bears that the warning has been executed in her majesty's name and authority, and that of the magistrates of the burgh. The officer ought to notify to the tenant the object of his visit, though it is not perhaps indispensable that he should do so. The execution of chalking is a warrant under which decree of removal will be pronounced by the burgh-court, in virtue of which the tenant may be ejected on the expiration of a charge of six days. See EJECTMENT.

CHALKLEY, THOMAS, 1675–1741; a Quaker preacher, native of London. He came to America in 1698, and traveled in Virginia, Maryland, and the New England colonies. Returning to England, he married, and soon afterwards came back and settled in Philadelphia. Again he crossed the sea and traveled in Holland and Germany; thence he went to the West Indies, where he died while engaged in missionary work. In his will he founded the library of the four monthly meetings of Friends in Philadelphia. The journal of his life and labors has been published.

CHALKY ISLAND, in New Zealand, near the s.w. extremity of Middle Island, about lat. 46° s., and lon. 166° 20′ east. It takes its name from being composed of a mass of white limestone, and imparts the same to the adjacent bay of 16 m. in length, and also to one of the harbors of the inlet.

CHALLEMEL-LACOUR, PAUL-AMANS. See page 892.

CHALLENGE. See DUEL.

CHALLENGE. See JURY.

CHALLONER, RICHARD, 1691–1781; the son of an English dissenter, but brought up among Roman Catholics, whose religion he embraced. He was ordained a priest at Douay, and made professor in the faculty. In 1730, he held the English mission in London, where he published several religious works. In 1758, he became vicar apostolic, residing generally in London; but during the "No Popery" riots of 1780, he retired into the country. He was the author of numerous controversial and devotional works, the most popular one being *The Garden of the Soul*, which has been frequently reprinted, and translated into various languages. He revised the Douay Bible (in English); and as an antidote to Foxe's well-known *Martyrology*, he wrote *Memoirs of Missionary Priests and Other Catholics of both Sexes, who suffered Death or Imprisonment in England on Account of their Religion.*

CHALMERS, ALEXANDER, 1759–1834; a Scotchman educated for a physician who gave up that calling for literature, writing for periodicals generally, and being for some time editor of the *Morning Herald.* Besides revised editions of standard authors, he published a *General Biographical Dictionary*, in 32 vols.; a *Glossary to Shakespeare;* and *British Essayists* from the *Tatler* to the *Guardian*, both inclusive.

CHAL'MERS, GEORGE, an eminent historical antiquary, was b. at Fochabers, Morayshire, Scotland, in 1742. Having attended King's college, Aberdeen, and afterwards studied law at Edinburgh, he went in 1763 to North America, where he practiced as a lawyer till the breaking out of the war of independence. Being a keen loyalist, he returned to Britain, where he was appointed clerk to the board of trade in 1786. The duties of this office he continued to discharge with diligence and ability till his death in 1825. Before his appointment, he had distinguished himself by various publications in political economy; and for some time after he devoted himself chiefly to editing the works of various authors and writing biographies. His great work is his *Caledonia; an Account, Historical and Topographical, of North Britain;* a production displaying profound research into the history of Scotland, and abounding in varied erudition. It was intended to be completed in 4 vols. 4to. The first volume, containing the historical

part, appeared in 1807; of the other three, which were destined to give an account of the several counties, the second, embracing Roxburghshire, Berwickshire, Haddingtonshire, Edinburghshire, Linlithgowshire, Peeblesshire, and Selkirkshire, appeared in 1810; the third, containing the counties of Dumfries, Kirkcudbright, Wigton, Ayr, Lanark, Renfrew, and Dumbarton, appeared in 1824. A fourth volume is understood to have been left at his death, ready for the press.

Among his other publications are: *Political Annals of the United Colonies* (Lond. 1780); *On the Comparative Strength of Great Britain, during the present and the four preceding Reigns* (Lond. 1782, 1786, 1794, 1802, 1812); *A Collection of Treaties between Great Britain and other Powers* (2 vols, Lond. 1790); *Life of Daniel Defoe* (Lond. 1786); *Life of Thomas Ruddiman* (1794); *Life of Mary Queen of Scots* (Lond. 1818); editions of the works of Allan Ramsay (1800), and of sir David Lindsay (1806), with memoirs; also various pamphlets apologizing for those, himself included, who had believed in the authenticity of the Shakespeare manuscripts forged by Mr. Ireland.

CHALMERS, James Ronalds. See page 893.

CHALMERS, Thomas, d.d., ll.d., was b. at Anstruther, in Fifeshire, 17th Mar., 1780, educated at the university of St. Andrews, and in his 19th year licensed to preach the gospel. In 1803, he was ordained minister of the parish of Kilmany, in Fifeshire, about 9 m. from St. Andrews. At this period his attention was entirely absorbed by mathematics and natural philosophy, to the neglect of the studies appertaining to his profession. To gratify his love of scientific pursuits, he even formed mathematical and chemistry classes in St. Andrews during the winter of 1803–04, and by his wonderful enthusiasm and lucidity of exposition excited intense interest, and obtained for himself a great reputation. In 1808, he published an *Inquiry into the Extent and Stability of National Resources*, which proved his capacity for dealing with questions of political economy. Shortly after this, certain domestic calamities, and a severe illness of his own, opened up the fountains of his soul, and rendered him keenly susceptible to religious impressions. Having to prepare an article on Christianity for Brewster's *Edinburgh Encyclopædia*, he commenced an extensive study of the evidences, and rose from his investigations convinced that Christianity was a *fact*, and the Bible the veritable "word of God." Then the great genius of the man broke forth like sunshine. He grew earnest, eloquent, devout, and faithful to his pastoral duties. In July, 1815, he was translated to the Tron church and parish, Glasgow, where his magnificent oratory took the city by storm. His *Astronomical Discourses* were probably the most sublimely intellectual and imaginative that had ever been preached in a Scottish pulpit. They were published in 1817, and had a prodigious popularity. During the same year he visited London, where his preaching excited as great a sensation as at home. But C.'s energies could not be exhausted by mere oratory. Discovering that his parish was in a state of great ignorance and immorality, he began to devise a scheme for overtaking and checking the alarming evil. It seemed to him that the only means by which this could be accomplished was by "revivifying, remodeling, and extending the old parochial economy of Scotland," which had proved so fruitful of good in the rural parishes. In order to wrestle more closely with the ignorance and vice of Glasgow, C., in 1819, became minister of St. John's parish, "the population of which was made up principally of weavers, laborers, factory-workers, and other operatives." "Of its 2,000 families," says Dr. Hanna, "more than 800 had no connection with any Christian church, while the number of its uneducated children was countless." We have not space to narrate at length how vast and successful were the labors of Chalmers. It is sufficient to say, that in pursuance of his favorite plan, he broke up his parish into 25 districts, each of which he placed under separate management, and established two week-day schools, and between 40 and 50 local Sabbath-schools, for the instruction of the children of the "poorer and neglected classes," more than 1000 of whom attended. In a multitude of other ways he sought to elevate and purify the lives of his parishioners. While in Glasgow, C. had matured his opinions relative to the best method of providing for the poor. He disliked the English system of a "compulsory assessment," and preferred the old Scotch method of voluntary contributions at the church-door, administered by elders. The management of the poor in the parish of St. John's was intrusted to his care by the authorities, as an experiment, and in four years he reduced the pauper expenditures from £1400 to £280 per annum.

But such herculean toils began to undermine his constitution, and in 1823 he accepted the offer of the moral philosophy chair in St. Andrews, where he wrote his treatise on the *Use and Abuse of Literary and Ecclesiastical Endowments* (1827). In the following year he was transferred to the chair of theology in Edinburgh, and in 1832 published a work on political economy. In 1833 appeared his Bridgewater treatise, *On the Adaptation of External Nature to the Moral and Intellectual Constitution of Man.* It was received with great favor, and obtained for the author many literary honors; the royal society of Edinburgh electing him a fellow, and the French institute a corresponding member, while the university of Oxford conferred on him the degree of d.c.l. In 1834, he was appointed convener of the church-extension committee; and after seven years of enthusiastic labor, announced that upwards of £300,000 had been collected from the nation, and 220 new churches built. Meanwhile, however, troubles were springing up in the bosom of the church itself. The evangelical party had become predominant in the gen-

eral assembly, and came forward as the vindicators of popular rights; the struggles in regard to patronage between them and the "moderate" or "Erastian" party became keener and more frequent, until the decision of the civil courts in the famous "Auchterarder and Strathbogie" cases brought matters to a crisis; and on the 18th of May, 1843, C., followed by 470 clergymen, left the church of his fathers, rather than sacrifice those principles which he believed essential to the purity, honor, and independence of the church. See articles DISRUPTION and FREE CHURCH. The rapid formation and organization of the Free church were greatly owing to his indefatigable exertions, in consequence of which he was elected principal of the Free church college, and spent the close of his life in the zealous performance of his learned duties, and in perfecting his *Institutes of Theology*. He died suddenly at Morningside, Edinburgh, May 30, 1847.

This is not the place for a criticism on the works of C., which extend to more than 30 volumes. It is sufficient to say, that they contain valuable and, in some cases, original contributions to the sciences of natural theology, Christian apologetics, and political economy; while on minor topics, such as the church-establishment question, they exhibit both novelty and ingenuity of argument. As an orator, C. was unique and unrivaled. We read of men, in the history of the Christian church, whom we can believe to have been as eloquent, impassioned, and earnest, but nowhere do we encounter a man in whom intellect, feeling, and imagination were so harmoniously combined—a nature so "nobly planned, to warn, to comfort, and command." Scotland never produced a greater or more lovable soul, one more gentle, guileless, genial-hearted, or yet more fervid, from the strength of a resolute and irresistible will, before whose impetus difficulties were dashed aside as by a torrent. There have been some loftier and more purely original minds in Scotland than C.'s, but there has never been a truer one, nor a heart whose Christian faith and piety were more intense, sincere, and humane.

CHÂLON-SUR-SAÔNE, a t. of France, in the department of Saone-et-Loire, about 33 m. n. of Mâcon. It is situated on the right bank of the Saone, at the point where that river is joined by the Canal-du-Centre, which unites the Saone with the Loire, and secures C. an extensive traffic with the central districts of France, as well as with the Mediterranean and Atlantic. The town is generally well built, good quays line the river, along which also the finest houses extend. Vineyards, wood, meadows, and cultivated fields surround and add variety and beauty to the situation. Its manufactures include hats, hosiery, vinegar, oil, pottery, jewelry, and imitation pearls ; and it has a large trade in the agricultural and other produce of the district. Steamboats navigate the Saone from C. downwards. Pop. '76, 20,571. C. occupies the site of the ancient *Cabillonum* or *Caballinum.*

CHÂLONS-SUR-MARNE, a t. of France, in the department of Marne, 107 m. e. of Paris by railway. It stands on the right bank of the river Marne, which is here crossed by a handsome stone bridge. C. is old ; and the houses consist chiefly of timber, lath, and plaster. The situation, however, is agreeable, and the town contains some fine public buildings, the principal of which is the cathedral, in the sanctuary of which there is one of the finest grand altars in France. On the east side of the town there is the splendid *Promenade du Jard,* or park, which covers 19 acres. C. has manufactures of woolens, cotton, leather, etc., and a considerable trade in grain, hemp, rape-seed oil, and Champagne wine. Pop. '76, 20,215. Previous to the union of Champagne with France in 1284, the population numbered about 60,000. In 1856, Napoleon III. formed the celebrated camp of C. to the n.e. of the town, which was occupied during the Franco-Prussian war by Canrobert, and afterwards by MacMahon. On the night of Aug. 21, 1870, MacMahon withdrew his troops ; and next day the town was occupied by the Germans.

CHALOTAIS, LA, LOUIS RENÉ DE CARADEUC, 1701–85 ; procureur-general of the parliament of Brittany, where he was a decided opponent of Jesuits. Grimm asserts that Chalotais's reports led to the suppression of the Jesuits in France. Voltaire gave C. high praise for his essay on national education. Later in life he was subjected to long political persecution, but was finally found free of blame, and resumed his place in the parliament at Rennes.

CHALYBÆ'US, a genus of birds very closely allied to the baritahs (q.v.), but having a rather thicker bill, and the nostrils pierced in a broad membranous space. The species are natives of New Guinea, and are birds of the most beautiful plumage, remarkable for the brilliancy of their metallic tints, and particularly for the resemblance to burnished steel, to which they owe their name (Gr. *chalyps, -ybos,* steel). On this account, they are sometimes included under the name of birds of paradise ; and the skin of *C. paradisæus,* deprived of its feet, is sold as that of a bird of paradise.

CHALYBÆUS, HEINRICH MORITZ, a German philosopher, was b. 3d July, 1796, at Pfaffroda, in Saxony, and educated at Leipsic. After spending some years in teaching, he was appointed in 1839 professor of philosophy in the university of Kiel, where he remained till his death in 1862. His chief works are the *Historische Entwickelung der speculativen Philosophie von Kant bis Hegel* (1836—English translations by Edersheim and Tulk); *System der speculativen Ethik* (1850); *Philosophie und Christenthum* (1853); and *Fundamental Philosophie* (1861).

CHALYB′EATE WATERS are those which contain a considerable portion of iron in solution. They are of two kinds, *carbonated* and *sulphated.* The *carbonated C. W.* contain carbonate of iron (FeO,CO_2) dissolved in excess of carbonic acid, and may be recognized by forming an ochry deposit of red oxide of iron (Fe_2O_3) on the surface of the stones near the mouths of the springs, owing to the escape of the carbonic acid on exposure to the air. Islington Spa near London, Tunbridge Wells, and Oddy's Saline C. W. at Harrogate, are examples of this class. Where an excess of carbonic acid is present, communicating a sparkling aspect to the water and an acidulous taste, as at Pyrmont and other places, the term *acidulo-chalybeate* or *acidulo-ferruginous* is applied. The *sulphated C. W.* contain sulphate of iron (FeO,SO_3) dissolved in them, and examples of this class are afforded at the Isle of Wight (the Sand Rock spring), Vicars bridge, Moffat, etc. C. W. are characterized by a more or less inky or styptic taste ; by becoming of a purplish black tint when infusion of galls or tea, and some varieties of wine, are added ; and by giving a pale blue color on the addition of a few drops of ferrocyanide of potassium (yellow prussiate of potash). C. W. are of great service in cases of debility, and the *acidulo-carbonated* kind being lighter on the stomach, is generally preferred ; but all C. W. are to be avoided in plethoric, febrile, and inflammatory conditions of the system.

CHAM, or Amedée De Noe, 1819–79; b. Paris; the son of a former peer of France; he was intended for the polytechnic school, but preferring painting he studied with Paul Delaroche, and afterwards with M. Charlet, where he developed a talent for the grotesque. Beginning in 1842, he contributed, chiefly to *Charivari* (the *Punch* of France), an immense number of caricatures, and some sketches, under the signature of "Cham." His political cartoons are singularly sharp and effective. He also produced many vaudevilles. He d. 1879.

CHA′MA, a genus of lamellibranchiate mollusks. The shell consists of two unequal valves, having two hinge-teeth in the one valve, and one in the other. The general form of the shell approaches to orbicular. The shell is generally thick, and is foliated with leaf-like projections, which arise in a somewhat regular manner from its surface; these and the colors of some of the species combining to make them very beautiful. The shells of the *chamæ* are often called *clams* or *clamp* shells, a name which they share with some of the *pectens, spondyli,* etc. They are found only in the seas of warm climates, none further n. than the Mediterranean. The Linnæan genus C. contained many species now removed to other families, but the restricted genus C. is the type of a family *chamidæ.* Thirty fossil species have been referred to C., 4 from the cretaceous period, and 26 from the tertiary.

CHAMADE′. See Parley.

CHAMÆ′ROPS, a genus of palms, with fan-shaped leaves, less exclusively tropical than palms are in general, and of which one species, *C. humilis,* is the only palm truly indigenous to Europe. It extends as far n. as to the neighborhood of Nice. It is sometimes called the Palmetto. The flowers are in spathes about 6 to 8 in. long; the fruit is a triple blackish spongy drupe, which is eaten, as are also the young shoots. This palm is so tolerant of a cold climate, that a specimen has lived in the open air in the botanic garden of Edinburgh for more than 50 years, with the protection of matting in very severe winters. In its native regions, the leaves are much used for thatching, and for making brooms, hats, chair-bottoms, etc. They abound in an excellent fiber, which the Arabs mix with camel's hair, and make into tent covers: cordage, and sometimes sail-cloth, are made of it in Spain; it is imported into France, and used for making carpets, under the name of *African hair.* The French in Algeria make paper and pasteboard of it; and it is supposed that it may prove a valuable commercial commodity, as a material for paper-making.—Other species of the genus abundant in India, China, etc., serve similar purposes, and deserve attention in connection with paper.—To this genus belongs also the West Indian palm, which yields the material for chip hats (see Brazilian Grass); and the palmetto (q.v.) of North America is by some botanists referred to it.

CHAMALA′RI, a peak of the Himalaya between Thibet and Botan, in lat. 28° 4′ n., and long. 90° e., said to have an elevation of 27,200 ft., or more than 5 m. and a furlong.

CHAMBA, a feudatory state of n. India, subordinate to the Punjab government, between 32° and 33° 9′ n., and 75° 54′ and 76° 30′ east. A range of mountains separate C. from Kashmir. C. is about 65 by 50 m. in length and breadth; pop. 140,000. The agricultural products are wheat and millet, and among other productions are timber, nuts, wax, honey, lime, and slate.

CHAMBER, of a piece of artillery, or small arm, is a contracted part of the bore, at the breech end. The C. contains the charge of powder, but is too small to contain the shot or shell. Some of these cavities are spherical, some cylindrical, some conical with a hemispherical termination, and some pear-shaped. Carronades and shell guns are usually chambered. The charge just fits the C., and the ball or shell comes in contact with it. Chambered guns are more slow to load and fire than those which are not chambered; and therefore the adoption of this form depends very much on the kind of service in which the weapon is to be employed. Its primary use is in kinds of ordnance in which the charge is small compared with the caliber, and in which, consequently,

there would be great loss of power unless the charge were confined within a comparatively limited space at the time of the explosion.

CHAMBER OF COMMERCE, a body of merchants and traders, associated for the purpose of promoting the interests of its own members, of the town or district to which the society belongs, and of the community generally, in so far as these have reference to trade and merchandise. Of the means by which these objects are sought to be accomplished, the following may be mentioned as the most prominent: 1. By representing and urging on the legislature the viws of their members in mercantile affairs; 2. By aiding in the preparation of legislative measures having reference to trade, such, for example, as the bankrupt acts; 3. By collecting statistics bearing upon the staple trade of the district; 4. In some places, by acting as a sort of court of arbitration in mercantile questions; 5. By attaining by combination advantages in trade which might be beyond the reach of individual enterprise.

These institutions are of continental origin, and, like so many others which England has borrowed from that source, were first introduced into Scotland. The oldest C. of C. in France is that of Marseille, which dates from the end of the 14th or commencement of the 15th century. This chamber was invested with very remarkable powers. It shared in the municipal jurisdiction, and in the administration of justice in mercantile questions. It was several times suppressed and re-established, and it was not till 1650 that its powers were fixed, and that it received its ultimate organization, The second chamber in France was that of Dunkerque, which was established in 1700. The same year a council-general of commerce was instituted at Paris, which, in addition to six councilors of state, consisted of twelve merchants or traders, delegated by the principal commercial towns of the kingdom, an arrangement which led within the next few years to the formation of chambers of commerce everywhere in France. We thus find that the chamber at Lyon was instituted in 1702, those of Rouen and Toulouse in 1703, of Montpellier in 1704, of Bordeaux in 1705, etc. By an order of council of Aug. 30, 1702, a direct relation was established between these various chambers and the central council of commerce. These chambers were all suppressed by a decree of the national assembly in 1791, but they were re-established by a consular edict in 1802, which fixed the population of the towns in which they might be established, and the number of their members, who were to be chosen from amongst the merchants who had carried on trade in person for a period of not less than ten years. Sixty of the best known merchants, presided over by the prefect or the maire, were charged to elect the members of these new chambers. They then presented to the government two candidates for the office of member of the general council of commerce, instituted at Paris under the minister of the interior. This organization was again modified in 1832, and still later by the ordonnances of Sept., 1851, and Aug., 1852, by which these bodies are now regulated. In accordance with that decree, the members of these bodies are now elected by the chief merchants of each town chosen for that purpose by the prefect. Their number cannot be less than 9, nor more than 21. They hold office for six years, one third of their number being renewed every two years, but the members resigning being re-eligible. The functions now assigned to these chambers in France are—to give to the government advice and information on industrial and commercial subjects; to suggest the means of increasing the industry and commerce of their respective districts, or of improving commercial legislation and taxation; to suggest the execution of works requisite for the public service, or which may tend to the increase of trade or commerce, such as the construction of harbors, the deepening of rivers, the formation of railways, and the like. On these and similar subjects, the advice of the chambers, when not volunteered, is demanded by the government. In most of the other countries of continental Europe there are similar institutions for the purpose of conveying information and advice to the central government, and making it acquainted with local feelings and interests in commercial matters.

The oldest C. of C. in Great Britain is believed to be that of Glasgow, which was instituted 1st Jan., 1783, and obtained a royal charter, which was registered at Edinburgh on the 31st of the same month. That of Edinburgh was instituted in 1785, and incorporated by royal charter in 1786. The Edinburgh C. of C. was the first public body which petitioned for the abolition of the corn laws, and the adoption of free-trade principles; and stood almost alone in the United Kingdom in advocating the Suez canal project. It also originated the movement that government should undertake the telegraph service in connection with the post-office. Six hundred of the bankers, merchants, and ship-owners of Edinburgh and Leith constitute the chamber. The Manchester chamber, since so famous for its exertions in the cause of free-trade, was not established till 1820, and for many years it continued to be the only institution of the kind in England. Its members number about 400. In Hull there has been a C. of C. since 1837, but those of Liverpool, Leeds, and Bradford, notwithstanding the great trading and manufacturing interests of these towns, were not established till 1850, in which year, strangely enough, a similar institution was established in s. Australia. The Liverpool C. of C. numbers nearly 600. The annual income of the Manchester chamber is upwards of £600, that of Liverpool about £800, contributed entirely by the subscriptions of members, amounting generally to £1 1*s.* a year. There are now

chambers of commerce in all the great mercantile towns of Great Britain and Ireland, and in 1860 there was established an "Association of Chambers of Commerce of the United Kingdom." In Canada, there is a Dominion board of trade, which consists of the chambers of commerce, or boards of trade, as they are indifferently called, of a dozen of the most important cities of the Dominion.

CHAMBER OF COMMERCE, *ante*. The Chamber of Commerce of New York city is the oldest existing institution of the kind in America, organized in 1768, and incorporated by royal charter Mar. 13, 1770, under the name of *The Corporation of the Chamber of Commerce of the City of New York in America*. When the state government was established the charter was renewed by the legislature. It was composed at first of 24 of the most prominent merchants of the city, who established an exchange which has been ever since kept up, though not recently under control of the body. The objects of the Chamber of Commerce are to encourage and promote commerce, support industry, adjust disputes relative to trade, and procure such laws and regulations as may be found necessary for the benefit of trade in general. The membership is about 800, including nearly all the leading merchants, financiers, and business men of the city. Several years ago a court of arbitration was established, by which differences between members are adjusted, and much litigation in courts avoided. Meetings are held once a month. In the rooms of the chamber is a vast collection of commercial and other statistics. Similar bodies exist in other large American cities.

CHAMBER-COUNSEL, a barrister or advocate who gives opinions in his own chambers, but does not, or rarely does, plead in court.

CHAMBERLAIN, DANIEL HENRY. See page 893.

CHAMBERLAIN, JOSEPH. See page 893.

CHAMBERLAIN, Lord, or King's C., as he was formerly called, has been one of the principal officers of state from very early times, and for centuries he was an influential member of the government. He has the function of indorsing the king's answer on petitions presented to him, and very often of communicating his majesty's pleasure to parliament and to the council. He was always a member of the council himself, *ex officio*. Though he has long ceased to have any share in the responsibilities of government, the C. is still an officer of very high standing in the royal household. He has control over all the officers and servants of the royel chambers, except those of the bedchamber, over the establishment attached to the chapel royal, the physicians, surgeons, and apothecaries of the household. The C. has further the oversight of the queen's musicians, comedians, trumpeters, messengers, etc.; and all tradesmen and artificers in her service are appointed by him. When the office of keeper of the great wardrobe was abolished in 1782, the duties of providing the state-robes of the royal family, the household, and officers of state, devolved on the lord chamberlain. All theaters in towns in which a royal palace is situated, require to be licensed by the Lord C., and no new play can be performed anywhere without his license. All persons desiring to be presented at levees or drawing-rooms, require to send their cards to the Lord C., and it is his duty to see that the persons thus applying are entitled by station and character to be presented to the queen. The C. also issues her majesty's invitations to balls, parties, etc. In accordance with ancient custom, the Lord C. is still a member of the privy council. His salary is £2,000 a year, but his tenure of office depends on that of the political party to which he belongs.

The Vice-chamberlain is the deputy and assistant of the Lord C., and in his absence exercises the full authority which belongs to his principal. His office existed in the time of Richard II. He is also dependent on the administration, and is usually a member of the privy council. His salary is £924 per annum.

CHAMBERLAIN, THE LORD GREAT, is a hereditary officer of great antiquity, and formerly of great importance. He has the government of the palace at Westminster, and, upon solemn occasions, the keys of Westminster hall and of the court of requests are delivered to him. At these times, the gentleman usher of the black rod, the yeoman usher, and the doorkeepers, are under his orders. At coronations, state-trials, banquets, and the like, the fitting-up of the hall devolves on him. When the queen goes to parliament, he delivers the sword of state to any member of the administration whom he chooses, to be borne before her majesty, he himself walking on her right hand. During the sitting of parliament, he has charge of the house of lords, and issues tickets of admission on the opening or prorogation of parliament. Some fees and perquisites belong to him. This office, conferred by Henry I. on Alberic de Vere, was inherited by female succession from the De Veres, earls of Oxford, by the Berties, and is now held conjointly by lady Willoughby de Eresby and the marquis of Cholmondeley, in right of their mothers, sisters and co-heirs of Robert, fourth duke of Ancaster. They discharge the duties alternately in each succeeding reign, a lady acting by deputy. Lord Aveland is at present deputy great chamberlain.

CHAMBERLAIN, JOSHUA L., LL.D., b. Me., 1828; a graduate of Bowdoin college. During the civil war he served with distinction, was six times wounded, and left the service with the rank of maj.gen. From 1866 to 1870, he was governor of Maine, and in 1871 was chosen president of Bowdoin college. When the democrats and fusionists under the lead of gov. Garcelon, in 1879–80 undertook to get possession of the state government, and there was some danger of civil war, C. was general-in-chief of the

militia of the state. He adhered to the regularly elected legislature, as sustained by the unanimous opinion of the supreme court, and by a quiet but firm hold of his lawful power, without any display of military force, prevented the intended violence and usurpation.

CHAMBERS, Practice before a Judge or Vice-chancellor at. It is to applications to the court in *banc* alone that the name of motions is properly given. But there are certain matters of subordinate importance, regarding which applications are made to a single judge at chambers, who decides in a summary way on the pleadings.

CHAMBERS, a co. in e. Alabama, on the Georgia border, intersected by the Atlantic and West Point railroad. Before a division was made to form Lee co., the area was 775 sq.m.; pop. '80, 23,440—12,078 colored. It is partly bounded by the Chattahooche river, and is intersected by the Tallapoosa. Productions, cotton, corn, wheat, and sweet potatoes. Co. seat, Lafayette.

CHAMBERS, a co. in s.e. Texas, on the gulf of Mexico, bounded on the w. by Galveston bay, and intersected by Trinity river; 900 sq.m.; pop. '80, 2187—693 colored. The surface is mainly prairie; productions, corn, cotton, and sweet potatoes. Co. seat, Wallisville.

CHAMBERS, Ephraim, the compiler of the first English encyclopædia. He was b. at Kendal in the latter part of the 17th c., and began life as an apprentice to a globe-maker in London, where he conceived the idea of his encyclopædia. The first edition of the work, in 2 vols. folio, appeared in 1728; ten years later, the 2d appeared; and in the year following, the 3d. The 4th was issued in 1741, a year after the editor's death. A 5th appeared in 1746, and a 6th, with new matter, in 1750. This work forms the basis of Dr. Rees's Cyclopædia in 45 quarto vols., and may be considered as the forerunner of the now countless publications of an encyclopædic character (see Encyclopædia).

CHAMBERS, George, 1803–40; an English painter. When a boy he followed the sea, where he made sketches of vessels, which so pleased his master that he canceled the boy's indentures. C. then apprenticed himself to an old woman who kept a paint-shop, and began house-painting. Finally he got employment as assistant in painting the panorama of London for the Colosseum, and then became scene-painter in a theater. His best works are naval battles, such as "The Bombardment of Algiers," and "The Capture of Porto Bello," both in the Greenwich hospital.

CHAMBERS, William and Robert, the editors and publishers of this *Encyclopædia* and other works; b. at Peebles, W. in 1800, R. in 1802. Bearing up against the difficulties of his early life, W. C. began business as a bookseller in Edinburgh, 1819, afterwards adding printing to his business. Between 1825 and 1830, he wrote the *Gazetteer of Scotland*, 1 vol.; and the *Book of Scotland*, 1 vol. R. C. also began business as a bookseller in Edinburgh, and from 1823 to 1830 wrote successively the *Traditions of Edinburgh*, 2 vols.; *Popular Rhymes of Scotland*, 1 vol.; *Picture of Scotland*, 2 vols.; and *Histories of Rebellions in Scotland, and Life of James I.*, 5 vols. Next, he edited *Scottish Ballads and Songs*, 3 vols.; and *Biography of Distinguished Scotchmen*, 4 vols. His *Traditions of Edinburgh* procured him the friendship of sir Walter Scott, who contributed various memoranda for the work. W. C. projected *Chambers's Edinburgh Journal*, and that periodical was commenced on the 4th of Feb., 1832, about six weeks in advance of the *Penny Magazine*, and may be considered the pioneer of that class of cheap and popular periodicals of a wholesome kind now so generally diffused. The success of the *Journal* was materially promoted by the essays, moral and humorous, of R. C., who from the first was an able collaborateur. United from this period in the peculiar profession of writing, editing, printing, and publishing, W. and R. C. issued a series of works designed for popular instruction, including the *Journal* (now amounting, in its different series, to 65 vols.). Among these works are *Chambers's Information for the People*, 2 vols.; *Chambers's Educational Course*, 150 vols.; *Cyclopædia of English Literature*, 2 vols.; *Miscellany of Useful and Entertaining Tracts*, 20 vols.; *Papers for the People*, 12 vols.; and the present *Encyclopædia*, 10 vols. In conducting these laborious undertakings, they necessarily depended on a number of accomplished literary assistants. In 1849, W. C. acquired the estate of Glenormiston in Peeblesshire, and a few years afterwards he founded and endowed an *Institution* in his native town for purposes of social improvement (see Peeblesshire). His later productions are—*Things as they are in America*, 1 vol. (the result of a visit to the United States in 1853); the *Youth's Companion, and Counselor*, 1 vol.; *History of Peeblesshire*, 1 vol. 8vo (1864); pamphlets on *Improved Dwellings* and *Co-operation among the Working Classes; Wintering at Mentone*, written from personal knowledge of the place during two successive visits; *France: its History and Revolutions*, 1 vol (1871); *Memoir of Robert Chambers, with Autobiographic Reminiscences;* and *Ailie Gilroy*, a story. More lately, *Stories of Remarkable Persons*, *Stories of Old Families*, and the *Story of St. Giles'* (1879). Twice elected lord provost of Edinburgh, W. C. occupied that office for four years (1865–69), during which he premoted several important public acts, including one for the improvement of the older part of the city. R. C. latterly wrote a work on *Ancient Sea Margins;* after which appeared his *Domestic Annals of Scotland*, 3 vols. He also edited the *Life and Works of Robert Burns*, 4

vols. A collection of his historical and miscellaneous papers was issued under the title of *Select Writings of Robert Chambers*, 7 vols. His latest production was the *Book of Days*, a most elaborate and exhaustive work in two large volumes, the preparation of which so injured his health, that he relinquished all further literary exertion. In 1863, he received from the university of St. Andrews the honorary distinction of LL.D. R. C. died at St. Andrews, 17th Mar., 1871, leaving a high character for literary application, integrity, and geniality of disposition. In 1872, W. C. received the honorary distinction of LL.D. from the university of Edinburgh. Engaged in miscellaneous literary labor, he remains head of the firm of W. and R. C., which owns an extensive printing and publishing establishment in Edinburgh, and a publishing establishment in London. The whole of the works issued by W. and R. C. aim at popular instruction, free of all political or sectarian bias. Perhaps their greatest effort in these respects has been the present *Encyclopædia*.

CHAMBERSBURG, the seat of justice of Franklin co., Penn., on the Cumberland valley railroad, 52 m. s.w. of Harrisburg; pop. '80, 6,877. C. is in the midst of a populous and well-cultivated region, and has manufactories of cotton, wool, iron, paper, etc. The village is well built. A great part of it was burned July 30, 1864, by the confederates under gen. Early. C. is the seat of Wilson college for young women.

CHAMBERSBURGH, N. J. See page 893.

CHAMBERTIN, a vineyard in the department of Cote d'Or, France, 6 m. s.s.w. of Dijon. It covers about 60 acres, and produces a red wine notable for excellence.

CHAMBERY, a t. of Savoy, of which it is the capital, beautifully situated in a rich vine-clad valley, between two ridges of hills, about 45 m. w.s.w. of Geneva. Though situated at an elevation of nearly 1000 ft. above the sea, the climate of C. is mild; the scenery around, with the river Leysse flowing through the valley, is exceedingly fine. The town itself, however, is dull and uninteresting. Some towers and other fragments of the old castle of the dukes of Savoy, which dates from the 13th c., still remain. C. has manufactures of silk-gauze, soap, leather, hats, lace, and a trade in silk, wine, etc. Pop. '76, 16,486. From the middle of the 16th c. to the peace of Utrecht, 1713, C. was under the dominion of France; and again from the revolution to the congress of Vienna, 1815, when it was restored to the house of Savoy; but in 1860, by the cession of Savoy, it has again come under the rule of France.

CHAMBLY, a s.w. co. in the province of Quebec, Canada, on the St. Lawrence, opposite Montreal; 190 sq.m.; pop. '81, 10,858. It is intersected by the Montreal and Richelieu rivers, and by the Grand Trunk and the Champlain and Montreal railroads, and the Chambly canal. Chief town, Chambly.

CHAMBORD, a celebrated royal castle of France, in the department of Loir-et-Cher, situated in the midst of a vast walled park 21 m. in circumference, about 12 m. e. of Blois. Its foundation was laid in 1526, by Francis I., who employed 1800 men constantly in its erection until his death. The work was continued with less zeal by his successors, Henri II., Henri III., Charles IX.; and Louis XIV. and Louis XV. also made some additions to it. The building, which marks the transition between the fortified castle and Italian palace, is surmounted by a vast number of turrets, minarets, and cones; its most prominent features, however, being six enormous round towers, each 60 ft. in diameter. The double spiral staircase in the central tower is of great architectural interest, being so contrived that parties pass up and down without meeting each other. The castle has no less than 440 chambers. C. was the scene of the gallantries of Francis I. Here Henri II., Louis XIII., and Louis XIV. resided; and at one of the brilliant fêtes given at the castle by the latter, Molière performed, for the first time, his play of the *Bourgeois Gentilhomme*. Among the other occupants of C. were marshal Saxe, Stanislaus, king of Poland, and marshal Berthier, upon whom it was bestowed by Napoleon I. It was bought from Berthier's widow by a number of legitimists, and presented to the duc de Bordeaux, who is hence called comte de C. (q.v.).

CHAMBORD (Henri Charles Ferdinand Marie Dieudonné d'Artois, duc de Bordeaux), Comte de, the representative of the elder branch of the house of Bourbon, and of its claims to the French throne, was b. in Paris, Sept. 29, 1820. He is the grandson of Charles X., and the son of the duke of Berri who was murdered by Louvel, Feb. 14, 1820. The duke of Angoulême, Charles X.'s eldest son, being childless, the duke of Berri was heir-presumptive; and as, at his death, he left only a daughter, the joy was great when, seven months after, his widow gave birth to a prince, who received the title of duke of Bordeaux—that of comte de C., by which he has latterly been known, being derived from the castle of C. (q.v.), presented to him at his baptism. He was baptized, amid circumstances of great pomp, with water brought by M. de Châteaubriand from the river Jordan, and received the appellation of *l'enfant du miracle* ("the miraculous child"). When Charles X. abdicated the crown at the revolution in 1830, he did so in favor of his grandson, the duke of Bordeaux. The people, however, insisted on the "citizen king," and the elder Bourbons were banished. On the death of Charles X., the duke of Angoulême assumed the title of Louis XIX., and another party proclaimed the duke of Bordeaux king; but at last a reconciliation was brought about by prince Metternich. In 1839, the prince visited Italy, accompanied by his mother, and

was received by the petty courts with great distinction. After the death of the duke of Angoulême, in 1844, the heads of the different fractions of legitimists met to pay their united homage, and the duke of Bordeaux made a "pilgrimage to Belgrave square" to receive it. In 1846, he married the eldest daughter of the duke of Modena, who had never acknowledged the monarchy of July. After the revolution of 1848, many legitimists were returned to the national assembly. In 1850, the duke of Bordeaux, or count of C., as he styles himself, appeared at Wiesbaden, where a congress of his adherents assembled to consult as to their future policy. As the count of C. is without heirs, a union, or "fusion," as it is called, of the partisans of the elder Bourbons with the Orleanists was effected, but no attempt made to carry out the arrangement. After the capitulation of Paris in 1871, the count of C. returned to France, and, under the title of Henry V., issued a proclamation, in which he promised, if placed by the nation at the head of its affairs, to maintain the temporal power of the pope. Neither this nor subsequent manifestoes have induced the French people to accept of him as their king.

CHAMBORD, Marie Thérese Béatrice Gaëtane, Countess de, Archduchess of Austria; b. July 14, 1817; wife of the Bourbon who calls himself Henry V of France, and eldest daughter of Francis IV., duke of Modena. Her sister was the wife of Don Juan de Bourbon, and mother of Don Carlos, duke of Madrid. She won great reputation and respect for her care of sick and wounded French soldiers during the German war.

CHAMBRE ARDENTE ("the fiery chamber"), a name given at different times in France to an extraordinary court of justice, probably on account of the severity of the punishments which it awarded, the most common being that of death by fire. In the year 1535, Francis I. established an inquisitorial tribunal, and a chambre ardente. Both were intended for the extirpation of heresy. The former, of which the pope was a corresponding member, searched out, by means of spies, cases of heresy, and instructed the processes; while the latter both pronounced and executed the final judgment. Under Henri II., the activity of the C. A. received a new impulse, the entranee of that monarch into Paris on the 4th July, 1549, being signalized by the burning of several heretics. But Francis himself, gallant and gay, as courtly history represents him, also seemed to relish a spectacle of this kind, for on various occasions he and his mistress presided at a burning. By and by, the C. A. relaxed in its penalties, and a cry was got up among the more bigoted Roman Catholics that it was conniving at heresy. This seems to have roused the "lurking devil" in its members, and, in order to wipe away the reproach, they commenced a series of unheard-of cruelties, which, along with other events, contributed to originate the religious war of 1560. In 1679, Louis XIV. employed it for a new and more praiseworthy purpose—viz., to investigate the numerous reports of poisoning cases which the trial of the marchioness Brinvilliers (q.v.) caused to be circulated. Many persons of the first rank, such as the maréchal de Luxembourg, and the princess Louise of Savoy, were examined on suspicion, but no one was executed except the pretended sorcerer, Voisin (1680), after whose time the C .A. ended its activity.

CHAMBRE INTROUVABLE (Fr. unfindable chamber; i.e., the chamber the like of which is not to be found again) was the name sarcastically given to that chamber of deputies in France which met after the second return of Louis XVIII. (July, 1815), and which, by its fanatical royalty, began to throw the country and society anew into commotion. The former chamber, which had shown much moderation, had been dissolved under the influence of the court party; and the ministry, led by Talleyrand, had done everything to procure for the ruling party at least a manageable chamber adapted for business. The number of the deputies was arbitrarily raised from 259 to 392; and to secure the victory of a complete restoration, all rushed forward who saw in the constitutional charter an encroachment on their privileges and pretensions. When it is considered, in addition, that the elections at least in the departments of the south, took place under terror and the sanguinary outrages of a populace in a state of political and religious excitement, that the press was stifled, and the people deprived of all freedom of expression by the foreign armies, ultra-royalism could not fail to be completely triumph ant. When the ministers saw this startling result, they did not venture to open the session; they resigned, and gave place to the Richelieu ministry Then broke out the most frightful excesses in the southern provinces. At the elections in Nîmes (22d Aug.), more than 100 persons were killed by the royalist bands. At last, on 7th Oct., the king opened the chamber, on which he enjoined quietness and moderation; and it appeared as if it did take this advice to heart for an instant. But when, in one of the first sittings, Boyer d'Argenson asked for the intervention of the chamber in behalf of the Protestants, who were being slaughtered in the south by the ultra-royalist bands, the speaker was called to order, and the chamber from that time ceased to observe any bounds or moderation. The fanatical legislation of this chamber inspired the ministers, the king, and especially the emperor Alexander, with so much aversion and apprehension, and also met so decidedly with the disapprobation of all peaceful and sincere friends of the throne, that the news of its dissolution, on 5th April, 1816, was received with universal rejoicing. The electoral law of 5th Feb., 1817, prevented the return of a similar chamber; and it was not till by the modified electoral law of 1820 that ultra-royalism regained a predominating influence in parliament. It is said that Louis XVIII. first

used the epithet *chambre introuvable* in an ironical sense, and that the majority of the chamber took it seriously as a compliment.

CHAMBURE, Auguste Lepelletier de, 1789–1832; a French soldier, whose daring at Dantzic in 1813, and in other places during Napoleon's wars, earned for him the name of "the devil." He was a prisoner for a time, but was released, and restored to military command in France. After Louis Philippe came to the throne, C. became one of the staff of Soult, minister of war.

CHAME'LEON, a southern constellation within the antarctic polar circle, and containing nine stars.

CHAMELEON, *Chamæleo,* a genus of saurian reptiles, constituting a distinct family, of very peculiar form and structure, and on various accounts highly interesting. The body is much compressed; the dorsal line sharp, in some of the species rising into an elevated crest; the back of the head is also elevated into a sort of cone. The neck is very short, and does not admit of the head being turned, for which, however, compensation is found in the remarkable powers of motion possessed by the large prominent eyes, which move independently of one another, and are covered with a membrane pierced only with a small hole for the pupil to look through. There are no external ears. The skin is not covered with scales, but, like shagreen, rough with granules. The legs raise the body rather higher than in most of the saurians; the toes, both of the fore and hind feet, are divided into two sets, one directed forward, and the other backward, so that each foot has the power of grasping like a hand. The tail is long and prehensile. The lungs are very large, and are connected with air-cells that lie among the muscles and beneath the skin, so that the animal has a remarkable power of inflating itself with air. The tongue is remarkably extensile, and is the organ by which the animal seizes the insects which constitute its food, being darted at them with unerring aim, whilst a viscous saliva causes them to adhere to it, and they are carried with it into the mouth. Chameleons are slow in their movements, except those of the eyes and tongue, and remain long fixed in one spot, awaiting the approach of insects, which they seize on their coming within reach. They all live among the branches of trees. Their power of fasting is great, and along with their gulping of air in respiration, and their habit of inflating themselves with air, gave rise to the fable, current among the ancients and until recent times, of their living on air. Their celebrated power of changing color is not equally fabulous, and perhaps it would be rash in the present state of knowledge on the subject to assert how far it has been exaggerated. It is probably in part under the control of volition, and may be used, as has been asserted, to render the animal less easy of observation, by assimilating it to the color of surrounding objects; it may depend in part on the action of light; it is certainly connected with the fear and other passions of the creature. Milne Edwards has discovered that it depends upon the presence of two differently colored layers of pigment in the skin.

Chameleons are natives of the warm parts of the old world, but are most abundant in Africa. One species is found in some parts of the s. of Europe, as near Cadiz. The whole number of known species is small.—When brought, as they frequently are, to Great Britain, they soon die, apparently from the coldness of the climate.

The fables which, in former times, were current regarding the C. were extremely numerous and ridiculous. It supplied not a few of those medicines to which absurd credulity ascribed the most marvelous powers.

CHAM'FERING. In architecture, an angle which is slightly pared off, is said to be chamfered. The chamfer is sometimes made slightly concave, in which case it is called a *hollow* chamfer. Chamfers, in Gothic architecture, have frequently ornamental terminations of various kinds. The term C. is applied to wood-work as well as stone.

CHAMFORT, Sébastien Roch-Nicolas, 1741–94; one of the most remarkable and among the first of French Bohemians, or brilliant but thriftless authors, or wits. He was the illegitimate son of a strolling actress, and never knew his father. Starting in life with only the name "Nicolas," he found his way to Paris, got into the college des Grassins, worked hard, and won nine prizes out of ten in two years. Much disgusted with the Latin hexameters that crowned his college reputation, he considered the time wasted which he had spent over them, summarizing his opinion in the contemptuous epigram, "What I know I do not know; what I do not know I guess." He assumed the name of C., and began writing for the press for bread and renown. Being repelled alike by booksellers and editors, he took to writing sermons at a louis each for lazy or incompetent priests. Having successfully competed for one of the academy prizes, the salons of the upper world were opened to him, and he became fashionable. He went on with alternate success and failure, always poor, and living for the most part upon eleemosynary dinners and suppers, repaying countenance and sustenance with his always brilliant but cynical and sarcastic conversation. He was entertained at Sèvres for some years by Mme. Helvetius, and Chabanon gave him his pension of 1200 livres in the *Mercure de France.* C. also took two more academy prizes, won a hundred livres from Necker, and obtained an enormous reputation. He wrote little and talked much; his reputation increased, and finally, under the protection of the duchesse de Grammont, he went to court, where the prince de Condé made him his secretary. He was now

about 40 years old, and fast growing misanthropic. He resigned his secretaryship and retired into solitude at Auteuil, where he fell in love and married a lady attached to the household of the duchesse de Maine. She was a clever, amusing woman of the world; but in six months she left C. a widower. Then he traveled in Holland, where he lived awhile with M. de Narbonne. Then, returning to Paris, he received the chair in the academy left vacant by the death of Sainte Pelaye in 1781. He haunted the court and made himself loved in spite of his withering and uncontrollable irony; but in consequence of an unfortunate love affair he left the court and was received into the house of M. de Vaudreuil; about which time he made the acquaintance of Mirabeau, whom he assisted with orations, and whom he followed heart and soul into the storm and tumult of the revolution. He forgot his old friends; he frequented the clubs, and was for a time secretary of that of the Jacobins; he became a street orator; was among the first of the storming party to enter the Bastile; and worked for a royalist journal in which he depreciated kingships. With the fall of the Girondins his political life came to an end; but he could not restrain the tongue that had made him famous: he no more spared the convention than he had spared the court. This rashness was the cause of his arrest, and he was threatened with a second arrest, whereupon he attempted suicide with pistol and poignard; and, shockingly hacked and shattered, dictated to those who came to arrest him the well-known declaration: "I, Sebastien Roch-Nicolas Chamfort, declare that I would sooner suffer death as a free man than be conducted as a slave to prison." He did not die immediately, but lingered awhile in charge of a gendarme. To the abbé Sieyès he had given fortune in the title of a pamphlet, *What is the Third Estate? Everything. What has it? Nothing.* And to Sieyès also he spoke the famous sarcasm: "At last I am about to leave the world, where the heart must be broken or be changed to brass." As a writer, C. left little of value. It was as a conversationist, and especially for his epigrammatic wit and cynicism, that he won a world-wide fame.

CHAMIER, Frederic, an English novelist, was b. in London, 1796. He entered the navy as a midshipman in 1809, and distinguished himself in the American war. He left the service in 1833. The success of Marryat in depicting sea-life led C. to try the same field, in which he was not without success, though in invention and humor he falls short of his model. His best romances are—*Life of a Sailor* (3 vols., Lond. 1834); *Ben Brace* (3 vols., Lond. 1835); *The Arethusa* (3 vols., Lond. 1836); *Trevor Hastings* (3 vols., 1841); *Passion and Principle* (3 vols., 1843); *Tom Bowline* (3 vols., 1839); *Jack Adams* (3 vols., 1838), etc. All his novels have been translated into German. C. wrote a *Review of the French Revolution of* 1848 (Lond. 1849), in which he gives a rather prejudiced view of some of the prominent actors. He died on the 1st of Nov., 1870.

CHAMISSO, Adelbert von, one of the most celebrated of German lyric poets, was b. in 1781, at the castle of Boncourt, in Champagne. His parents settling in Prussia in 1790, he became a page of the queen, and entered upon a military career. But when the campaign of 1806 broke out, he returned to France, for though no admirer of Napoleon, he was unwilling to fight against his native land. At this time, he was thrown into the circle of Madame de Staël at Coppet, and there began that study of natural philosophy which he afterwards pursued at Berlin. In 1814, count Rumjanzow, chancellor of the Russian empire, prepared an exploring expedition round the world at his own expense; C. accompanied it as naturalist. He embarked at Cronstadt under capt. Otto von Kotzebue, chief of the expedition, which, however, failed in its main object—that of discovering a *north-east* passage. Subsequently, he obtained a situation in the botanical garden of Berlin, was made a member of the academy of science; and after a happy domestic life, died there in 1838, universally loved and honored. He wrote several works on natural history, but his fame rests chiefly on his poetical productions. As early as 1804–1806, he, together with Varnhagen von Ense, published a *Musen Almanach.* In 1813, he wrote his original and amusing fiction called *Peter Schlemihl*, the story of the man who loses his shadow, which has been translated into almost all the languages of Europe. The character of his poetry is wild and gloomy, and he is fond of rugged and horrible subjects. In his political songs, he succeeds well in humor and irony; nor is he deficient in deep and genuine feeling. Indeed, several of his ballads and romances are masterpieces in their way. We may instance one of his longest poems, *Salas y Gomez*, written in terza rima, as a proof how peculiarly German the cast of C.'s mind was, despite his French origin. His collected works, in six volumes, appeared at Leipsic in 1836–39.

CHAMOIS, *Antilope rupicapra*, Ger. *gemse*, a species of antelope (q.v.) inhabiting the Alps and other high mountains of central and southern Europe, as the Pyrenees, the Carpathians, and the mountains of Greece; also those of some of the Mediterranean islands, Caucasus, Taurus, and other mountains of the w. of Asia. It is one of the antelopes sometimes designated *capriform* or goatlike, because of their departure from the typical or true antelope form, and approach to that of the goats. The C. is about the size of a large goat, but the neck is longer in proportion, and the body shorter; the horns seldom more than 6 or 7 in. long, black, rising nearly straight up from the forehead, and so bent back at the tip as to form a hook. The color is brown, deeper in winter than in summer; the tail is black; the head is of a pale-yellow color, with a dark-brown band along each cheek.

The usual summer resort of the C. is in the higher regions of the mountains which it

inhabits, not far from the snow-line, and it is often to be seen lying on the snow. In winter it descends to the higher forests. The aromatic and bitter plants of the mountain-pastures are its favorite food. It is—like the ruminants generally—very fond of salt; "and many stones are met with in the Alps, hollowed out by the continual licking of the C., on account of the saltpeter with which they abound." It is gregarious: flocks of 100 are sometimes seen; but in the Swiss Alps, where the numbers have been much reduced by hunting, the flocks are generally very small, and often consist only of a few individuals. Old males often live solitarily. The C. produces one or two young at a birth, in the month of Mar. or April.

It is an animal of extraordinary agility, and flocks may often be observed sporting in a remarkable manner among the rocky heights. It can leap over ravines of 16 to 18 ft. wide; a wall of 14 ft. high presents no obstacle to it; and it passes readily up or down precipices which almost no other quadruped could attempt. It is said to descend obliquely almost perpendicular precipices of more than 20 ft., striking its feet once or twice against the rock, as if to stay and guide its descent, and alighting securely, often on a very narrow ridge of rock, with its hind feet first, and bringing the forefeet almost into contact with them.

The hunting of the C. is an occupation attended with great hardships and much danger, but of which, nevertheless, some of the Swiss peasants become passionately fond. The hunter sometimes goes out on the adventurous chase alone; but more frequently several go out together, dividing into parties; and whilst the flock of C. flee from those whose approach they first descry, an opportunity of using the rifle is obtained by their comrades. The scent of the C. is extremely keen; and when by this sense it is apprised of the approach of the hunter, it becomes alarmed and restless until it sees him, upon which it rushes hastily in an opposite direction, and so falls into the ambuscade. When a flock of C. is feeding, one is always on the watch, and by a sort of whistle, announces apprehended danger.—The flesh of the C. is highly esteemed. Its skin is made into leather, and from it the original *shammoy*, or *shammy* leather, so much prized for softness and warmth, was obtained, although the name has now become common also to leather prepared from the skins of other animals. See LEATHER.—When taken young, the C. is easily tamed.—The C. of the Persian mountains is smaller and of a paler color than the European variety, and its horns bend from the base.

CHAM'OMILE, or CAMOMILE, *Anthemis*, a genus of plants of the natural order *compositæ*, sub-order *corymbiferæ*, distinguished by imbricated bracts, a scaly conical receptacle, a ray of one row of female florets, those of the disk hermaphrodite, the achænia obscurely four-cornered, and destitute of pappus. The species are annual and perennial herbaceous plants, chiefly natives of Europe and other temperate parts of the world. Several are found in Britain, amongst which is the COMMON C. (*A. nobilis*), the most important species of the genus, well known for its medicinal virtues, a perennial plant with a stem about a foot long, procumbent and much branched, each branch terminated by a flower (head of flowers) more than an inch broad, with yellow disk and white ray, the whole plant intensely bitter and highly aromatic. Its medicinal virtues are ascribed to the essential oil which it contains, *oil of chamomile*, which abounds most of all in the involucre. This oil is of a greenish-yellow color, and is used in the preparation of some medicines. The dried flowers are often administered in the form of an infusion, as a stimulant of the nerves of the abdomen, an alterative and antispasmodic; or are applied to the skin as an anodyne, and on account of their power of promoting absorption and suppuration. The infusion also acts as an emetic, and is often used to assist the action of other emetics. C. flowers find a place in the pharmacopœia, and are also amongst the most esteemed of domestic medicines, the plant being extensively cultivated for their sake, and very generally finding a place even in cottage-gardens. Yet they ought to be used with caution, as they have been known to produce congestion in the brain, and are very apt to aggravate any malady of this kind already existing. A double-flowering variety of C. is more generally cultivated than the single, to supply the C. flowers of the shops, the flowers being whiter and more bulky, but it is otherwise rather inferior. C. is easily propagated by parting the roots. It delights in a dry and rather poor soil.—The name WILD C. is given to a very similar plant, also a native of Britain (*matricaria chamomilla*), an annual belonging to a genus closely allied to *anthemis*. It may readily be distinguished by the want of scales on the receptacle. Its medicinal virtues resemble those of common C., and although now disused in Britain, it is in some parts of Europe preferred for internal use, because it is less bitter, less nauseous, and generally milder and more agreeable in its operation.—No small quantity of common C. is illegally used in the manufacture of beer in England, and is imported from Germany for this purpose. Yet this plant is so abundant in some parts of the s. of England as to form a principal part of the pasture in sheep-walks, and to fill the whole air with its scent. The other British species of C. (*anthemis*) are mere weeds; one of them, called stinking C. (*A. cotula*), is so acrid as to blister the fingers, if much handled. But the flowers of the OX-EYE C., or DYER'S C. (*A. tinctoria*), a native of many parts of the continent of Europe, yield a beautiful yellow dye, on account of which the plant is often cultivated.

CHAMOND, ST., a t. of France, in the department of Loire, situated at the confluence of the Gier and the Ban, about 7 m. N.E. of St. Etienne, on the railway between that

place and Lyon. It is a flourishing well-built town, with extensive manufactures of ribbons and stay-laces. C. has also several silk-mills and numerous iron furnaces and foundries; and extensive coal-mines exist in the vicinity. Pop. '76, 14,420.

CHAMORERIL, a lake of Ladakh or Middle Thibet, in lat. 32° 55′ n., and long. 78° 15′ e. It lies at a height of 15,000 ft. above the sea, on the plateau between the upper waters of the Sutlej and of the Indus, girt by mountains which rise, at some points, 5,000 ft. above its own level. Though it is beyond the recognized limits of perpetual congelation, yet it freezes only in winter, and is hence supposed to be of great depth. Necessarily receiving much water from the surrounding mountains, it is without any visible outlet—evaporation alone, even at this elevation, appearing to maintain one uniform surface on a length of 15 m., and a width of 2½.

CHAMOUNI, or CHAMONIX (Lat. *Campus munitus*), is the name of a wild and romantic valley and village among the Alps in Savoy. It lies at a distance from all the high-roads, at an elevation of about 3,400 ft. above the level of the sea, and more than 2,000 ft. above that of the lake of Geneva. The valley is about 13 m. long, and about 2 broad, and is traversed by the Arve. It is bounded at the e. end by the Col de Balme, over which there is a mule-path to Martigny, in the upper valley of the Rhone, and from the other end issues the road to Geneva, which lies at a distance of 53½ m. from Chamouni, On the n. side lies mont Breven and the chain of the Aiguilles Rouges, and on the s., the giant group of mont Blanc, from which enormous glaciers or rivers of ice slide down, even in summer, almost to the bottom of the valley. The chief of these glaciers are the Glacier des Bossons, des Bois, d'Argentière, and du Tour. By ascending to a point called Montanvert, we come upon the upper course of a glacier, where it expands into a great mountain-lake of ice called the Mer de Glace, in which there is a solitary rock or oasis called Le Jardin, about seven acres in extent, and covered with the most beautiful herbage. The excursion to the Jardin is one of the most striking excursions within the range of Chamouni. Until 1741, the valley was almost unknown; the region was considered a wilderness, and known by the name of Les Montagnes Maudites, or "accursed mountains." In the above year, it was visited by two Englishmen, Pocock and Wyndham, who ascended as far as Montanvert; and a granite block there still bears the name of the Englishmen's stone. It was only, however, in 1775, that the attention of travelers was effectually called to it by Saussure and Bourrit. The valley is rich in peculiar plants, and furnishes an aromatic and perfectly white honey. The village of C. owes its origin to the Benedictine convent founded between 1088 and 1099. The pop. of the village is about 2,400, who depend partly upon the strangers who visit the valley, and partly upon the pastures and upon hunting. There are several good hotels, and the best guides are to be found here for the neighboring Alps. It is from C. that mont Blanc is usually ascended.

CHAMPAC, *Michelia champaca*, an Indian tree, possessing great beauty both of foliage and flowers; and much venerated both by Brahmanists and Buddhists. Images of Buddha are made of its wood. Its flowers have a pale-yellow tint, and a sweet oppressive perfume, much celebrated in the poetry of the Hindus.

CHAMPAGNE, formerly a province of France, now forming the departments of Seine-et-Marne, Aube, Yonne, Haute-Saone, and Ardennes. The province was about 180 m. long by 150 broad, its surface presenting extensive plains with ranges of hills, especially in the north and east. Upon these hills is grown the famous Champagne wine.

In ancient times, C. was known as a part of Gallia, was subjugated by Cæsar, and afterwards was annexed to the kingdom established by the Franks. After the 11th c., it had its own dukes, who were vassals of the French kings. By the marriage of Philippe IV. with Joanna, heiress to the kingdom of Navarre, Champagne, and Brie, C., in 1284, came to the French crown, and was incorporated by Philippe VI., in 1328. During the campaign of 1792, the eastern part, and, in the campaign of 1814, the western part, of C. was the chief arena of warfare.

CHAMPAGNE, or CHAMPAIGNE, PHILIPPE DE, 1602–74; a painter of Brussels, born of a poor family. He was a pupil of Fouquier, and in 1621 was employed with Nicholas Poussin to paint in the Luxemburg palace. His best work is in Vincennes, and in the Carmelite church in Paris, where may be seen his celebrated crucifix. He became first painter to the queen of France, and rector of the Paris academy.

CHAMPAGNE WINE is the produce of vineyards in the above-mentioned province of Champagne. There are white and red champagnes; the white is either sparkling or still. Sparkling or effervescent (*mousseux*) C. is the result of a peculiar treatment during fermentation. In Dec., the wine is racked off, and fined with isinglass, and in Mar. it is bottled and tightly corked. The fermentation being incomplete when the wine is bottled, the carbonic acid gas generated in a confined space dissolves in the wine, and communicates the sparkling property to champagne. To clear the wine of sediment, the bottles are first placed in a sloping position with the necks downward, so that the sediment may be deposited in the necks of the bottles. When this sediment has been poured off, some portion of a *liqueur* (a solution of sugar-candy in cognac) is added to the wine, and every bottle is filled up with bright clarified wine, and securely

re-corked. The effervescence of the wine thus prepared bursts many bottles, in some cases 10 per cent; and in seasons of early and sudden heat, as many as 20 and 25 per cent have been burst. Wine-buyers estimate the value of wine according to the breakage, that which breaks most bottles being considered best. Still or non-effervescent C. is first racked off in the Mar. after the vintage. Creaming or slightly effervescent C. (*demi-mousseux*) has more alcohol, but less carbonic acid gas than sparkling champagne.

The best varieties of this wine are produced at Rheims and Epernay, and generally on a chalky soil. Among white Champagnes of the first class, the best are those of Sillery, which are of a fine amber hue, dry spirituous, and possessing a superior *bouquet;* those of Ay and Mareuil are less spirituous, but are sparkling, with a pleasant bouquet. Other white wines of first class are those of Hautvilliers, Dizy, Epernay, and Pierry.

In the first class of red C., or Montagne, we have the varieties of Verzy, Verzenay, Mailly, St. Basle, Bouzy, and Thierry; all having fine color, clearness, good body, sufficient spirit, and a pleasant *bouquet.* The trade in Champagne wines is chiefly carried on in Rheims, Avise, Epernay, and Chalons-sur-Marne. The cellars in which the vintages are stored are cut out of the calcareous rock. The fact that the sale of C. is very extensive and lucrative, has naturally given rise to adulterations. Sugar, and the juices of pears or gooseberries, or birch-juice, etc., have been used for making spurious Champagne. It may fairly be reckoned that not even a third part of the wine sold for C. in Paris is genuine. The greater part of it is readily manufactured by simply charging other light wines with carbonic acid gas. Recently, the German purveyors have succeeded in preparing light wines—such as Rhenish, Main, Neckar, Meissner, and Naumburg—so much like genuine C., as to deceive even the connoisseur. Altogether, it is estimated that the district produces 1,100,000 hectolitres (24,200,000 gallons) of genuine C., of which, however, the finest growths make but a small part.

CHAMPAIGN, a co. in e. Illinois, intersected by the Toledo, Wabash and Western, the Chicago branch of the Illinois Central, and the Illinois, Bloomington and Western railroads; 880 sq.m.; pop. '80, 40,870. The surface is level, and the chief productions are corn, broom-corn, oats potatoes, wheat, hay, cheese, butter, wool, and sorghum molasses. Co. seat, Urbana.

CHAMPAIGN, a co. in w. Ohio, intersected by Mad river, and by the Cincinnati, Sandusky and Cleveland, the Pittsburg, Cincinnati and St. Louis, and the Atlantic and Great Western railroads; 390 sq.m.; pop. '80, 27,817. The chief productions are corn, wheat, oats, potatoes, hay, butter, and wool. There are also a number of important manufactories. Co. seat, Urbana.

CHAMPAIGN, a city in Champaign co., Ill., on the Illinois Central and the Indianapolis, Bloomington and Western railroads, 128 m. s.s.w. of Chicago. It is the seat of the Illinois Industrial university. Champaign is a handsome and growing place, 2 m. from Urbana, the county seat, with which it is connected by horse railroad. Pop. '80, 5,103.

CHAMPARAN, a district in India, in the Behar province, under the jurisdiction of the lieutenant-governor of Bengal; 26° and 28° n. and 84° and 86° east. The district is a vast level except in the n. and n.w., where it is undulating and rugged as it nears the mountains of Nepaul. The s. and w. portions are well cultivated, and have a dense population. The whole population in 1872 was 1,440,815, of whom 86 in a hundred were Hindus, 14 Mohammedans, 7 unspecified, and one in a hundred Christians. There are only two towns of consequence Bettiah, pop. 19,708; and Motihari, the headquarters of the district, pop. 8,266. The principal crops are rice, corn, barley, sugar-cane, opium, and indigo; and the mineral products, gold, copper, and limestone. Indigo, saltpeter, and rope are the only manufactures.

CHAM'PARTY, or CHAMPERTY (Fr., from Lat. *campi partitio*, a division of lands), an offense known to the law of England, which consists in a bargain between the plaintiff or defendant in a suit, and a third party, generally a lawyer, that the latter shall have part of the land, debt, or other thing sued for, in the event of success, and that in the meantime he shall carry on the suit at his own expense. This practice has been strictly forbidden by statute in England from very early times (3 Edward I. c. 25; 13 Edward I. c. 49; etc.); and in Scotland the rule of the civil law by which the *pactum de quotâ litis* (q.v.) was held to be a *pactum illicitum* (q.v.), and as such void, has all along been part of the common law. Such practices were also forbidden by statute to members of the college of justice (1594, c. 216). There is this difference between the laws of the two countries, however, that whereas in England the offense has always been punished criminally, in Scotland the only penalty which it entails beyond nullity of the bargain, is deprivation of office. In former times, the evil chiefly apprehended from C. probably was, that the honesty of judges might be tampered with by advocates who were generally their friends, and not unfrequently their very near relatives, if permitted to be personally interested in the issue of the causes in which they were professionally employed. In our own day, the chief danger consists in the encouragement which might thus be given to dishonest and oppressive litigation, and the facilities which would be afforded for nefarious transactions between the agents on the opposite sides. That practices closely analogous to C., though unnamed, are not unknown in the lower strata of the legal profession in all countries, is but too probable. The necessities of

trade have further introduced considerable equitable modifications into the law of C., which will be explained under CHOSE IN ACTION. See BARRATOR.

CHAMP DE MARS, originally CHAMP DE MAI, the title given to annual meetings of the Franks of Gaul in the 5th c. and later. They were national assemblies in which the chief men gathered to pay obeisance to their chief; or were special meetings called by the king, to deliberate upon important matters; or military reviews. One of the Carlovingians changed the time of regular meeting from Mar. to May, whence the name. The Romans called them *plactia*.

CHAMP DE MARS, a great parallelogram in the environs of Paris, between the Seine and the Ecole Militaire, used especially for military purposes and drills. It is 1093 yards long and 537 wide, with four rows of trees on either side, flanked by ditches, and entered by five gates. It has been the site of many remarkable political and other demonstrations, from that against the legislative assembly in 1791, to the more peaceful universal expositions of 1867 and 1878.

CHAMPE, JOHN, 1752–98; a soldier in the revolutionary army, who was sent as a spy to New York with a view to carry off Arnold, who, after the discovery of his treason, had taken refuge in the British lines. C. discovered that Arnold was in the habit of walking in his garden at a late hour every night, and arranged to seize and hurry him to a boat and across the Hudson; but on the appointed night Arnold had changed his head-quarters and failed to appear. C. immediately escaped and rejoined the patriot army, but he was at once honorably discharged from service, lest if taken prisoner he should be summarily hanged as a spy.

CHAMPFLEURY (real name JULES FLEURY), b. 1821. Beginning as a clerk with a Parisian book-publisher, he speedily acquired reputation by such books as *Confessions of Sylvius; Adventures of Mariette; Stories of Winter, Spring, and Autumn;* and a number of pantomines. He is one of the founders of *L'Evenement* newspaper; and an author of *Les Oies du Noel* for Proudhon's *Voice of the People.* A satire on country life, *Les Bourgeois de Molinchart,* added to his fame. His works have been published with illustrations, including the *History of Ancient and Modern Caricature.*

CHAMPION (from a Gothic root signifying to contend, fight; Ang.-Sax. *camp,* fight). In the judicial combats of the middle ages, it was allowed to women, children, and aged persons, except in cases of high treason or of parricide, to appear in the lists by a representative. Such a hired combatant was called a champion. Those who followed this profession were generally of the lowest class, and were held disreputable; for besides the perils of the combat, they were liable to be executed as well as their clients. They were obliged to wear a peculiar dress of leather, and peculiar armor, which was also held disreputable. They were not allowed to fight on horseback, and appeared in the lists with their hair and nails cut short. Champions are mentioned as early as in the time of Charlemagne; and Otto I. employed them in deciding the succession to the empire. At a later period, in the age of chivalry, the word C. came to have a more dignified acceptation, and signified a knight who entered the lists on behalf of an injured lady, of a child, or of any one incapable of self-defense. In England, the crown even had its C., who, mounted on horseback and armed to the teeth, challenged, at every coronation at Westminster, all who should deny the king to be the lawful sovereign of the three realms. This practice is understood to have been first introduced under Richard II., and it continues to make a part of the ceremonial of an English coronation to this day. The name of C. was also given to the knight who, during a tournament, had charge to see that no injury or insult should be offered to the assembled ladies.

CHAMPION HILLS, in Hinds co., Miss., where, May 16, 1863, a confederate force under gen. Pemberton had a short fight with gen. Grant's forces, then marching upon Vicksburg. The confederates were beaten and forced to retreat to Big Black river.

CHAMPLAIN, LAKE, separating the states of New York and Vermont, and penetrating, at its n. end, about 6 m. into Lower Canada. It empties itself into the St. Lawrence, about 45 m. below Montreal, by the Sorel or Richelieu. It is navigable throughout for vessels of about 100 tons, having its communications improved by one canal on its own river, and by another to the Hudson. It stretches in lat. from 43° 30′ to 45° 6′ n., and in long. from 73° to 73° 30′ w.; its extreme breadth, however, never exceeding 15 miles. Its principal towns are Whitehall at the s., Plattsburg on the w., and Burlington on the east. Both lake C., and its tributary, lake George, have been prominent in the history of the country—during the rivalry of France and England before the conquest of 1759–60; during the revolutionary struggle of 1775–82; and lastly, during the war of 1812–14, between Great Britain and the United States.

CHAMPLAIN, LAKE (*ante*), discovered by Samuel Champlain in 1609, the year in which Henry Hudson discovered New York bay and the North river. The possession of this lake was a matter of importance in the war between the United States and Great Britain in 1812–15. In Aug., 1814, an English army of 12,000, led by sir George Prevost, passed up the w. side of the lake to Plattsburg, accompanied by a squadron of 16 vessels, 95 guns, and 1,000 men. The Americans had a hastily constructed fleet in Plattsburg, comprising 14 vessels, 86 guns, and 850 men. A fierce engagement took

place Sept. 11, in the beginning of which the English had the advantage, but the victory was with the Americans. The British land forces abandoned the design of invasion, and under cover of darkness and a storm hastily retraced their steps toward Canada, abandoning their sick and wounded, and a part of their baggage. There are in the lake about 50 islands, the largest of which are North and South Hero, and Isle La Motte. The lake is noted for its magnificent scenery, and is a favorite resort for summer tourists.

CHAMPLAIN, a co. in the province of Quebec, Canada, bordering on the n.w. bank of the St. Lawrence, about midway between Montreal and Quebec; 229 sq.m.; pop. '81, 26,818. It is intersected by the St. Maurice and other rivers. The soil is fertile, and there is abundance of good timber. Besides ordinary agricultural crops, tobacco and maple sugar are raised. Chief town, Batiscan.

CHAMPLAIN, a township in Clinton co., N. Y., on the Canada border, forming the extreme n.e. point of the state. It has a village of the same name; pop. of township, '80, 5,407. The village is on the Ogdensburg and Lake Champlain railroad, 114 m. e. of Ogdensburg. Rouse's Point is in this twp.

CHAMPLAIN, Samuel de, 1567-1635; the son of a sea captain, and when young in the army of Henry IV. of France. He accompanied the Spanish fleet to the West Indies, and on his return wrote an account of the voyage. In 1603, he was sent to Canada by De Chaste, on whom the king had bestowed some of the new territory. From 1604 to 1607, he was engaged in exploring the coasts and seeking a desirable place for a settlement. The next year he made a third voyage, and began a settlement at Quebec. After many misfortunes and struggles the settlement became prosperous. In 1629, it was captured by some English adventurers, and C. was taken to London, but was set at liberty in 1632. The next year he returned to Canada, and died there. C. was in fact the governor of the settlement from its commencement until his death.

CHAMPLIN, James Tift, D.D., b. Conn., 1811; a graduate of Brown university, and tutor therein; from 1838–41 pastor of a Baptist church in Portland, Me.; 1841–57, professor of ancient languages in Waterville college, and from 1857–72, president of of the same institution, now known as Colby university. He has published a number of college text-books.

CHAMPLIN, John Denison. See page 893.

CHAMPNEY, Benjamin, b. N. H., 1817; an artist noted for landscape painting of Alpine and White mountain scenery. In early life he was a lithographer in Boston.

CHAMPNEY, James Wells, b. Mass., 1843; learned the business of wood engraving, taught drawing, and studied painting in Europe. He served as a volunteer in the civil war. His wife, Lizzie Wells, is a popular writer.

CHAMPOLLION, Jean François, an illustrious name in modern Egyptian archæology, was b. Dec. 23, 1790, at Figeac, in the department of Lot, France. In 1801, he was introduced to Baron Fourier, secretary to the *Institut d'Egypte*, who initiated him into the science of Egyptian antiquities. In 1807, C. went to Paris, in order to pursue, with more advantage, his oriental studies; and, in 1809, was appointed professor of history in the lyceum of Grenoble. In 1811, he published his work, *L'Egypte sous les Pharaons*, intended as the forerunner of a more elaborate work on Egypt, of which only the geographical section appeared, in 1814. In his endeavor to decipher the Rosetta stone, C. labored under the error of supposing that in this inscription the hieroglyphics were wholly ideographic, and the demotic and hieratic characters wholly phonetic. Afterwards, he was led to believe that the hieratic characters were of the same nature as the hieroglyphic, and this conviction he expressed in a communication made to the *Académie des Inscriptions*, in Aug., 1821. In the same year he published his essay, *Sur l'Ecriture Hiératique des Anciens Egyptiens* (Grenoble), a work which is now scarce. In this essay he continued to assert the common ideographic nature of both hieroglyphic and hieratic characters. Meanwhile C. had been made acquainted with the conclusions of the acute mathematician, Dr. Thomas Young (q.v.), respecting the phonetic use of hieroglyphic signs. Without doubt, it was this important discovery, of which Dr. Young, however, made no great use, that set C. on the right track of investigation, and led to those brilliant results which were regarded by Niebuhr as constituting the greatest discovery of the century. By a comparison of the name of Ptolemy on the Rosetta stone with that of Cleopatra on the Philensian obelisk, he was enabled to lay the foundation of an alphabet, which he continued to elaborate until it now forms the basis of modern Egyptian archæology. His first decisive discoveries were made known in his celebrated *Lettre à Mons. Dacier* (Par. 1822), which was followed by the *Précis du Système Hiéroglyphique* (Paris, 1824; second ed. 1828); but his principal work, the *Grammaire Egyptienne*, was posthumously published in 1836.

In 1824, appeared his *Panthéon Egyptien;* and, in 1825, his celebrated letters to the duc de Blacas, in which he explains the names and titles of many of the Pharaohs, written on the monuments in Drovetti's Egyptian collection at Turin, and attempts to class them into dynasties. His theory of *interpretation* was much controverted at first, but its importance was recognized by such distinguished scholars as Rosellini, Bunsen, sir William Gell, and others.

In 1828, he was appointed by Charles X. to accompany a scientific expedition to

Egypt, of which the results were given by Rosellini in the *Monumens de l'Egypte et de la Nubie* (Par. 1835–45). On his return to Paris, 1830, C. was made a member of the *Académie des Inscriptions*, etc.; and, in the following year, was appointed to the new chair of Egyptian antiquities in the college of France; but soon after the commencement of his intended course of lectures, in May, 1831, he fell ill, and died, Mar. 4, 1832. According to Silvestre de Sacy, "few men, since the birth of letters, have rendered to erudition services equal to those which have consecrated to immortality the name of Champollion."

CHAMPOLLION-FIGEAC, Jean Jacques, a distinguished French archæologist, was b. 1778, at Figeac, in the department of Lot. After holding in Grenoble the offices of librarian and professor of Greek literature, he was appointed, in 1828, conservator of MSS. in the imperial library in Paris; but, after the Feb. revolution, was deposed from office by Carnot. In 1849, he was appointed, by Louis Napoleon, librarian of the palace of Fontainebleau. Besides the *Antiquités de Grenoble* (1807), his chief works include the *Annales des Lagides* and *Egypte Ancienne* (forming a part of *L'Univers Pittoresque*); *Les Tournois du Roi René*, a splendid work, with lithographs by Motte, and several publications of old French documents. After the death of his younger and more celebrated brother, C. was employed in editing the MSS. left by that distinguished scholar, and has given an account of them in the *Notice sur les Manuscrits Autographes de Champollion le Jeune* (Par. 1842). He died May, 1867.

His son, Aimé Champollion-Figeac, follows the same path of historical antiquarianism, and has published several interesting and useful works.

CHANAK'-KALESSI' (Turkish, "Pot Castle"), a t. of Anatolia, deriving its name from its manufactures of crockery, is situated on the Dardanelles, about 28 m. s.w. of Gallipoli. Its castle is the most important on the Dardanelles, which name is sometimes given to the town itself. Pop. some 3,000 or 4,000.

CHANCE, in its original and strict meaning, may be defined as that which determines the course of events, in the absence of law, ordinary causation, or providence. Strictly speaking, it is an idea which few would now be disposed to admit as corresponding to anything which really exists; the religious mind excluding it as inconsistent with the belief in the divine government, and the philosophical mind rejecting it as inconsistent with a recognition of universal laws of causation. As a word, however, it has always been, and always will be popularly accepted; and its use is correct so far as we overlook, or choose for the moment to throw out of view, the more universal connection of events, and regard them as their emergence, on a superficial view, appears to be determined. The idea of C., as referring to some apparently capricious or at least inexplicable cause of an event, distinguishes it from the word probability, or the degree with which the expectation of an event approves itself to a particular mind, the first expressing what metaphysicians would call an objective, and the second a subjective idea. It is clear that C., being only legitimate as an expression in popular parlance—or if admitted as a term in philosophy, one that would at once lead into the most inextricable problems—is a term which is much too indefinite to admit of any kind of measurement; while what we call probability, or the degree with which an expectation approves itself, owing to certain data presented to the mind, does, as we shall hereafter see, admit of a kind of measurement which leads to very important consequences. For these reasons, the consideration of what is sometimes called the *doctrine of chances*, but what is more properly the *theory of probabilities*, will be found under the head of Probability.

CHANCEL (Lat. *cancellus*, a screen). The C., choir, or eastern part of a church, was often separated from the nave by a screen of lattice-work, so as to prevent general access thereto, though not to interrupt either sight or sound. As it was in this part of the C. that the service was always performed previous to the reformation, the clergy were held to have a special right to it, in return for which its repairs in general still fall on the impropriator, rector, or vicar, and not on the parish. The chief pew in the C. belongs to the rector or impropriator, but the disposal of the seats in the church, with this exception, belongs to the ordinary, or, practically, to the churchwardens, to whom the authority of the ordinary is delegated. No monument, moreover, can be set up without the ordinary's consent. The term C. is usually confined to parish churches which have no aisles around the choir, or chapels behind it or around it; and in this case the C. and the choir have the same signification. But in larger churches there are sometimes chancels at the ends of the side aisles, and this whether the choir has the character of a choir in the larger sense, or of a chancel. See Church.

CHANCELLOR (Lat. *cancellarius*). It is said that the chief notary or scribe of the Roman emperor was called C., either because he was intrusted with the power of obliterating, *cancelling*, or *crossing out* (*cancellare*, to make lattice-work) such expressions in the edicts of the prince as seemed to him to be at variance with the laws, or otherwise erroneous; or because he sat *intra cancellos*, within the lattice-work or railings (*cancelli*) which were erected to protect the emperor from the crowding of the people when he sat in judgment. Neither the title nor the office of C. is at all peculiar to England. The C. of France (chancelier de France), from a very early time, was an officer of state of great power and dignity, under whom several other officers, bearing also the title of C., were employed in the administration of justice and in the defense of the public

order. The C. of France was the constitutional interpreter of the will of the sovereign; his functions being, on the whole, analogous to those exercised by the C. of England. As an instance in the change of the value of money, not more remarkable than many which could be cited in our own country, it may be mentioned that, in 1290, the salary of this high official was six sous a day, with the privilege, to him and his, of eating at the court. When he was at Paris, and ate at his own lodgings, he had 20 sous a day. The office was abolished at the revolution; and though it was restored by the Bourbons, and even under the first Napoleon the higher-sounding title of archi-chancelier was revived, many of the functions of the old C. were transferred to the minister of justice, and have ever since been held by him.

In most of the other countries of Europe there are officers of state who bear this, or analogous titles, though their powers and duties are very various. The chief functionary in the Austrian empire has often been termed C.; and on the reconstitution of the German empire, prince Bismarck was made "C. of the empire" (*Reichskanzler*). Besides these state-chancellors, there were officers in many other capacities to whom the title was given. Every bishop has his 'C. in the church of Rome, and there are still law chancellors of cathedrals, dioceses, universities, etc.

CHANCELLOR (*ante*). The constitutions of some of the United States create this officer and define his power by legislative statute. In New York, the officer was recognized with others of colonial (English) appointment in the first and second constitutions, but in the constitution of 1846 the court of chancery was abolished, and the C. passed out of office. The tendency of late years is to merge the courts of chancery into the superior law courts. Separate chancery or equity courts exist in only a few states; in others the courts of law sit also as courts of equity; in some equity relief is administered under the forms of the common law; and in others still the distinction between law and equity has been formally abolished. The federal courts exercise equity jurisdiction whether the state courts in the district are courts of equity or not.

CHANCELLOR, Lord. It is usually said that the existence of the office in England, as in the other states of Europe, is to be ascribed to the influence which the constitution of the Roman empire had on the constitutions of the modern nations. This influence was exercised in no small measure through the medium of the church, the profession of the law being generally exercised by ecclesiastics; and it is for this reason, probably, that the bishop and the king are furnished with officers bearing the same title, and exercising analogous functions. The C. is always the confidential adviser of the sovereign in state affairs. It is for this reason that he has been called the keeper of his conscience, and that in England it is to him that the duty was intrusted of presiding over a court which acted on what were called—by way of contradistinction—equitable considerations. It is in this latter prerogative that the chief distinction exists between the C. and all other judges; for, whilst they are held by the letter of the law, he was at one time supposed to act rather *juxta bonum et æquum*. In certain more special points of view, there is a similarity between the functions of the chancellors in different states. "In all of them he seems to have had the supervision of all charters, letters, and such other public instruments of the crown as were authenticated in the most solemn manner; and therefore, when seals came into use, he had always the custody of the sovereign's great seal."—Stephen's *Commentaries*, vol. iii. p. 398. It is from this last-mentioned circumstance that the office of C., or keeper (q.v.), which, by 5 Elizabeth, c. 18, is declared to be exactly the same, is created without writ or patent, by the mere delivery of the great seal, and that the C., if a baron, takes precedency of every temporal lord not a member of the royal family, and of all bishops except the archbishop of Canterbury. The C. is a privy-councillor by his office, a member of the cabinet, and prolocutor, or speaker of the house of lords, by prescription. Though the form in which his tenure of office is terminated, is by the resumption of the great seal by the sovereign, the C. practically resigns office with the party to which he is attached. He has the appointment of all justices of the peace throughout the kingdom, but this privilege he exercises generally on the recommendation of the lord-lieutenants. But the most important, and, as it now seems, somewhat anomalous branch of his patronage, arises out of his having been originally an ecclesiastic. Though the last bishop who held the office was John Williams, archbishop of York, who was lord keeper from July 10, 1621, to Nov. 1, 1625, the C. still continues to be patron of all the crown livings of the value of £20 per annum, or under (though in 1863 about 300 were sold to augment the incomes of those sold and those retained), and visitor of all hospitals and colleges of the king's foundation. As representing the paternal character of the sovereign, again, the C. is the general guardian of all infants, idiots, and lunatics, and has the supervision of all charitable uses in the kingdom. As regards his judicial patronage, the arrangement is, that the C. appoints in general all the judges of the superior courts, except the two chief-justices, who are nominated by the prime-minister of the day. Of inferior appointments, the latter also has reserved to him the commissioners of bankruptcy and the judges of the county courts. All these functions the C. performs in addition to his extensive duties as the supreme judge of the court of chancery, both as an ordinary court of common law and of record, and as an extraordinary court of equity. Much inconvenience had arisen from the accumulation of duties in the single

person of this high dignitary, and various expedients had been devised for lessening the evil. Vice-chancellors had been appointed, and the duties of the master of the rolls had been extended. In 1875, a considerable change was made by consolidating all the vice-chancellors' courts into one division, called the chancery division of the high court. And the C.'s duties in the house of lords as the highest appeal court were lightened in 1876. The proposal of a minister of justice has, however, not yet found favor. The salary of the C. is £10,000 a year, and he has an annuity of £5,000 on his retirement from office. The style of the C., since the union with Scotland, has been lord high chancellor of Great Britain; but he has scarcely any jurisdiction in Scotland, and in Ireland there is a separate C., having powers in most respects the same as those of the C. of Great Britain. To slay the C. is treason under 25 Edward III. c. 2.

CHANCELLOR OF A **CATHEDRAL** is an officer who superintends the arrangements for the celebration of the religious services. His office is quite distinct from that of the

CHANCELLOR OF A **DIOCESE**, who, as vicar-general to the bishop, is an ecclesiastical judge, appointed to assist the bishop in questions of ecclesiastical law, and hold his courts for him. By 37 Henry VIII. c. 17, it is provided that the C. of a diocese may be a layman, whether married or single, provided he be doctor of the civil law, lawfully create and made in some university. By the canons of 1603, he must be a bachelor of law, at the least, or a master of arts. There are certain cases, however, in which the bishop must sit in person. In case of complaint against a clerk in holy orders, for any ecclesiastical offense against the church discipline act (3 and 4 Vict. c. 86), the bishop is to hear the cause, assisted by three assessors; of whom the dean of his cathedral, or one of his archdeacons, or his chancellor, must be one; and a serjeant-at-law, or advocate who has practiced 5 years in the court of the archbishop of the province, or barrister of 7 years' standing, another.

CHANCELLOR OF THE **EXCHEQUER.** See EXCHEQUER.

CHANCELLOR OF **SCOTLAND.** Previous to the union of the two kingdoms in 1707, when the office was abolished, the C. of S. performed functions in many respects analogous to those which belong to the lord high chancellor of Great Britain. He presided in parliament, and was the head of all the courts of judicature; he was the chief counselor of the king, and keeper of the great seal. From the fact of the distinction between law and equity in the English sense never having been recognized in Scotland, the C. had no judicial functions separate from those of the ordinary courts of law, but he had the principal direction of the chancery, the constitution of which is described below. In early times, the C. of S., as of England, was very frequently an ecclesiastic; but the first, Constantine, earl of Fife, in the reign of Alexander I., and the last, the earl of Seafield, who held the office at the union, were both laymen; and many other nobles, earls of Argyle, Angus, Huntly, etc., appear in the lists given in Crawford's *Officers of State*, and Chalmers's *Caledonia*. On the abolition of the office, a keeper of the great seal was appointed, who acts merely ministerially in affixing it to the writs which pass under it. See GREAT SEAL.

CHANCELLORSVILLE, BATTLE OF, in Spottsylvania co., Va., between the union army under Gen. Hooker and the confederate forces under Gen. Lee, May 2, 1863. Hooker had succeeded Burnside in command of the army of the Potomac, and after nearly three months' work brought it into a state of efficiency. He had 132,000 men, 13,000 of whom were cavalry. This army, in seven corps, lay on the Rappahannock opposite to Fredericksburg. On the heights on the other (right) bank the confederate army was strongly intrenched; it numbered 62,000 men, of whom about 3,000 were cavalry. Hooker resolved to turn the confederate left flank, first sending nearly all his cavalry to destroy communication with Richmond. April 27th, Hooker sent 36,000 men up the left bank of the river beyond the confederate line, and they crossed safely. The objective point was C. a solitary brick dwelling-house in a wide and barren region. Before sunset, on the 30th, 48,000 union soldiers had reached the place. Another considerable union force had crossed the Rappahannock below Fredericksburg, and were making demonstrations in the confederate front. Lee appears to have been unaware of these movements until the evening of the 30th. At midnight his men were in motion, and before noon of May 1st he was in line of battle in Hooker's front. At daybreak "Stonewall" Jackson, with 30,000 confederates, moved behind the shelter of a dense forest (the "Wilderness"), and at 3 P.M., after a march of 15 m., fell upon the union army while the men were preparing their dinner, with arms stacked and their intrenchments unguarded. The union forces fled without making a stand, and pushed towards C. There they were with difficulty brought to a stand. Jackson, who had pursued them closely, rode out to reconnoiter, when he was fired on by his own men who mistook his escort for a union company. He died the next day. Thus far the greatest damage suffered by the federals was the temporary disorganization of Howard's corps, which was the weakest corps in the field; and this was more than supplied by the arrival during the night of a large corps from Washington. On the morning of May 3d (Sunday), Hooker was still on the defensive. The confederates began the attack, and it was hotly continued until 10 o'clock, both sides suffering severely. While Sickles was bearing the brunt of Stuart's attack, the ammunition

failed, and Sickles sent for aid. At the moment the message came to Hooker, he was struck by a spent ball and fell insensible to the ground; so there was no one to send aid to Sickles, and he was obliged to fall back. The weight of some half-dozen assaults fell upon his division, until he was overpowered and his lines destroyed. The day passed in desultory fighting and strategic movements, in which, on the union side, there was much indecision and loss of opportunity. During Monday night Hooker resolved to abandon his position, and threw up intrenchments to cover his bridges. A storm came on Tuesday afternoon, but during the night the union forces crossed the river, and the battle was over. The losses, as set forth in official reports, were: on the union side, 17,000, of whom 12,000 were killed and wounded and 500 missing; on the side of the confederates about 13,000, of whom 10,300 were killed and wounded and 2,700 missing.

CHANCELLOR OF A **UNIVERSITY.** The highest honorary office connected with a university is generally that of chancellor. See UNIVERSITY.

CHANCE-MEDLEY, AND CHAUD-MEDLEY, or MELLÉ (Fr. *chaud*, hot; and *mêlée*, a fray), as it is called in Scotland, are French expressions borrowed by our law. Though often spoken of as synonymous, they are, in reality, distinct in meaning—the one signifying a casual affray; the other, an affray in the heat of blood or passion. Both are in this country, and in most others, recognized as pleas in mitigation of the offense of *homicide* (q.v.). See also SANCTUARY.

CHANCERY (Lat. *cancellaria*). As the Roman emperors, and after them the various sovereigns who divided the vast inheritance of the empire, had each a chancellor (q.v.), so in every European kingdom there was an establishment called a *C.*, where these officers performed their functions. If we imagine a large chamber divided by lattice-work (*cancelli*), the outer half devoted to the people, the inner occupied by the chancellor and his subordinates, engaged in framing edicts, letters of nobility, and the like, and engrossing them on parchment, and sealing them with the king's own seal in proof of their authenticity, and then handing them through the railings to the people without, we shall have a pretty good conception of the C. in its earliest form.

In France, as there were subordinate chancellors attached to the parliaments of the respective provinces, so there were subordinate chanceries; but the grand C. of France, which followed the person of the king, was alone, in strictness, entitled to the name.

The apostolic C. at Rome, in which, in addition to the documents pertaining to his temporal sovereignty, the bulls and briefs of the pope are authenticated, is presided over by a cardinal, with the title of vice-chancellor.

CHANCERY, or CHANCELLARY, of Scotland, is a public office in the general register house at Edinburgh, managed by the director of C. and his deputes, in which all charters, patents of dignities, gifts of offices, remissions, legitimations, presentations, commissions, brieves, retours, and other writs appointed to pass the great and quarter seals are recorded. See GREAT SEAL.

CHANCERY, COURT OF, in England. Besides the functions pertaining to the chancellor in other countries, the chancellor of England had early assigned to him the office of a judge; and the English C. consequently became a court of law, the peculiar character of which will be rendered intelligible by the following considerations: In assigning judicial functions to the chancellor's department, it was not intended that it should interfere with that other department of government which has everywhere been distinguished both from the legislative and the executive—viz., the judicial. But in all departments, according to the imperial theory from which the idea of the C. at least was derived, the sovereign was supreme, and to his will, or to his sense of justice, there was consequently an appeal in judicial, as in other matters. His chancellor, however, was his adviser in all matters whatsoever; and thus, though not a judge in the stricter sense, it is manifest that his counsel, in judicial matters of the highest importance, would constantly be called in. But further, the king governed by laws, even before he was governed by them; and for the sake of order and his own convenience, he would naturally add to or supplement the law which he had established, only where it could be shown to him that it did not meet the substantial justice of the particular case. He would consequently be a judge, not of the interpretation or application of the law, which he would leave to his ordinary judges, but of its adequacy to circumstances which had changed, or had not been anticipated; and when he interfered, it would be to some extent in the character of a legislator, as well as of a judge. The king would thus be a judge in equity, in the popular and intelligible sense of that word; and acting in this capacity himself, it would be in this capacity that he would call in the aid of his chancellor. It is not mysterious, then, how in early times the court of C. came to be a court of equity; and the chief difficulty regarding its origin seems to attach to the other of the two great departments into which it is divided, and in which it exercises jurisdiction as a court of common law. But as the free constitution of England developed itself, it soon became apparent that equity, in the old despotic or patriarchal sense—in which it was not so much the administration as the making or modifying of law—was consistent with its principles, whether it proceeded from a judge or from the monarch himself. The popular sense of equity was consequently abandoned; and a technical sense, unknown to the jurisprudence of every other nation, was given to it.

The proceedings of the court of C. "on its equity side," which had hitherto been a mere supplement to law, came now to be hedged in by rules and precedents as closely as those of any court of common law. What henceforth continued to be the distinction *in principle* between law and equity, or between the functions of the courts of common law and the court of C., or even of the two great departments of this court itself, it is perhaps impossible to state. The arbitrary line which has been drawn between the class of cases assigned to the one set of courts and to the other, will be considered under EQUITY.

The judicial duties of the chancellor have long been shared by the master of the rolls, an officer of high rank, who was originally appointed only for the superintendence of the writs and records appertaining to the common law departments of the court, but who was accustomed also to sit as a separate though subordinate judge on the equity side. The disputes which had arisen regarding his powers were set at rest by 3 Geo. II. c. 30, which declares that all orders made by him, except such as by the course of the court are appropriated to the great seal alone, shall be valid, subject nevertheless to be discharged or altered by the lord chancellor, and so as that they shall not be enrolled till they are signed by his lordship. By 3 and 4 Will. IV. c. 94, the master's powers are further increased, and he may now hear motions, pleas, and demurrers, as well as causes generally. The salary of the master of the rolls (q.v.) is £6,000 a year. The vast increase of business, and the still greater increase of arrears, during the previous half-century, rendered it necessary, in 1813 (53 Geo. III. c. 24), to appoint another assistant to the chancellor, under the title of the vice-chancellor of England; and in 1841, when the equity business of the exchequer was transferred to the C., two more vice-chancellors were added. Each of these judges sits separately from the lord chancellor, and their functions extend to both departments of the court. Their salaries are £5,000 a year. Another important addition (14 and 15 Vict. c. 83) was that of the lords justices of the court of appeal for all courts. This court consisted of the lord chancellor, together with these judges; but the lords justices, when sitting without the chancellor, possess the same jurisdiction which belongs to him, and their existence does not prejudice his right to sit alone. The lords justices possess the same authority in matters of lunacy as the chancellor; and they, sitting together, constitute, without the chancellor, the court of appeal in bankruptcy. An appeal, which may also be entertained by the lord chancellor sitting alone, lies to this court from all the separate courts of the chancery division; and from this appellate jurisdiction there is an appeal in turn to the house of lords. The lords justices may also take up original causes, though these, in practice, are mainly confined to the divisional courts of the high court. Till recently, certain parts of the equitable jurisdiction of the court of C. were confided to the masters in ordinary (see MASTERS IN CHANCERY) and the accountant general. The office of the masters has been abolished, but that of the accountant continues to be one of the most important connected with the court. Besides these more important officers, the court of C. has always had a large body of subordinates, registrars, taxing-masters, and a staff of record and writ clerks attached to it.

The subdivision of courts into those of equity and common law had long been found mischievous, inasmuch as it in some cases doubled the expense to the suitor, by sending him from one court to another for instalments of the justice which he sought. For many years this anomalous arrangement had been given up as indefensible; and bills from time to time were introduced into parliament, in order to rearrange the courts, so as to administer entire justice in every case. Great changes were necessary in this department of the law, and the only question was at last reduced to the best mode of settling the details of the high court of justice, which was to supersede the previously existing courts. For the changes ultimately carried through under the judicature acts of 1873–'76, and the constitution of the new high court of justice, see COMMON LAWS. The C. court is now the chancery division of the reconstituted high court.

In various colonies of the British empire, local courts have been established in imitation of the high court of C., an institution which, from its cumbrous, anomalous, and unscientific character, scarcely merited imitation; but in America, though the distinction between law and equity was at first adopted and long adhered to with the tenacity with which Englishmen cling to their native customs, it has been abolished in the state of New York, and law and equity there, as elsewhere in the world, now constitute one system, administered in one series of tribunals of original and appellate jurisdiction. On the continent, the English court of C. has always been a subject of ridicule; and a recent French writer, in speaking of it, says: "Nothing ever comes to an end in it; and the unhappy man who has a process there, can be sure of but one thing—viz., that whether he gains it or loses it, his ruin is certain." The acts by which evils which were inseparable from the constitution of the court of C.—and which spring from the distinction between law and equity, on which its very existence depended—had been mitigated, were the following: 15 and 16 Vict. cc. 80, 86, and 87, 21 and 22 Vict. c. 27, 23 and 24 Vict. cc. 38, 128, 25 and 26 Vict. c. 2.

CHANCERY, COURT OF (*ante*), in this country exists only in a few of the states; some never established the court at all, and a number which inherited it from English colonial times or established it in their first constitutions have abolished it and given the equity duties to the courts of law. According to latest authority, the court of chan-

cery exists in Alabama, Delaware, Florida, Mississippi, New Jersey, Tennessee, and Vermont; but in most of these states the court of chancery is held by a justice of the supreme court.

CHAN'CRE. See SYPHILIS.

CHANDAH, a t. of India, on the s.w. frontier of the territory of Nagpore, on the left bank of the river Eraee, near its junction with the Wurda, 90 m. s. of the town of Nagpore. Its walls, built of cut stone, and surrounded by a high parapet, are 6 m. round, from 15 to 20 ft. high, and flanked with round towers large enough for the heaviest guns. Within the place, and almost equidistant from the n. and s. faces, is a citadel; the rest of the interior consists of straggling streets, detached houses, and plantations. It is well supplied with water. In 1818, C. was taken by the British. Pop. 16,233. C. is capital of a British administrative district having an area of 9,700 sq.m., and a pop. of 534,431.

CHANDÂL'A, the lowest of the impure classes in Hindu caste. Besides the four pure classes there are various mixed and more or less impure classes, some of which, the C. for instance, are so vile that their shadow is pollution, and no true Hindu will take shelter under the same roof or tree with them.

CHANDELEUR ISLANDS, in the gulf of Mexico, between the mainland of Mississippi and the mouth of the river. There is a light on the n. end of the most northerly island, in 30° 8′ n., and 88° 52′ west.

CHANDERNAGORE', a French city, with a scanty territory of about 2000 acres, on the right or w. bank of the Hoogly, 21 m. above Calcutta by railway, on the opposite shore, in lat. 22° 50′ n., and long. 88° 23′ east. The population, estimated at about 30,000, consists of a few Europeans and Eurasians, the great bulk being natives of unmixed blood. Independently of political considerations, the place has, through the gradual silting up of the river, lost some of its commercial advantages. Within 100 years back, ships of the line ascended to C.; now, however, vessels even of far inferior burden seldom get above Diamond Harbor, which is nearly 50 m. further down. C. was established in 1676, and for awhile rivaled Calcutta. It was captured by Clive in 1757, but finally restored to the French in 1816.

CHANDHAIREE', or CHANDERI, a t. of Gwalior, India, in a hilly and jungly district, near a tributary of the Jumna. It is at present much decayed, on account of Mahratta oppression, the scourge of war, and the decay of its manufactures, which are undersold by the cheaper fabrics of Britain; but the extent and architectural excellence of its ruins indicate its splendor and importance in former times, when it is said to have contained 14,000 stone houses, 384 markets, 360 caravanserais, and 12,000 mosques. The fort of C., formerly deemed impregnable, consists of a strong rampart of sandstone, flanked by circular towers, and is situated on a high hill. Among other remains of former greatness, is a pass cut through a solid rock 100 ft. high. During the native wars, being a place of importance, C. was frequently besieged. Under Mahratta sway, it became a haunt of freebooters, very troublesome to the native districts under British rule or protection; and on the conclusion of the treaty of 1844, it was, among other lands, assigned for the maintenance of the increased Gwalior contingent, commanded by British officers.

CHANDLER, CHARLES FREDERICK, PH.D., LL.D., b. Mass., 1836; educated at Harvard, Berlin, and Gottingen. In 1857, he had charge of the chemical department of Union college, and in 1864, was made professor of chemistry in the school of mines of Columbia college. In 1858, he held the chair of chemistry in the New York college of pharmacy. He is a member of the chemical societies of Berlin, Paris, and London. In 1870, with his brother he established *The American Chemist.* Recently he has been the chief officer of the board of health of New York city, and has paid much attention to sanitary reforms. He is the author of many important scientific papers, the greater number of which can be found in his magazine.

CHANDLER, DR. RICHARD, a scholar and antiquary of considerable eminence of the last century, was b. at Elson, in Hampshire, in 1738, and educated at Oxford. He first became known as the editor of the magnificent work, *Marmora Oxoniensia,* published by the Oxford university in 1763. He afterwards traveled through Greece and Asia Minor, with Revett, an architect, and Pars, a painter, at the instance of the then flourishing Dilettanti society, with a view to collect information regarding the former state of these countries, and to procure exact descriptions of the ruins. The result of their united labors appeared in 1769, in 2 vols., entitled *Ionian Antiquities.* C. also published a valuable account of the ancient inscriptions of Asia Minor and Greece; and his account of his travels in these countries, issued in 1765–76, is still a standard work. He also published a *History of Troy.* He died in Feb., 1810.

CHANDLER, JOSEPH R. See page 893.

CHANDLER, SAMUEL, D.D., 1693-1766; a dissenting minister of Berkshire, England, the son of an eminent non-conformist divine. He studied at Gloucester and Leyden, and held life-long friendship with bishop Butler and archbishop Secker. He was a fellow of the royal and antiquarian societies, and received offers of high preferment in the established church, but these he positively refused and remained until his death a Presby-

terian minister. He was forty years pastor of the meeting house in the Old Jewry. He left many sermons, commentaries, and other works pertaining to religious and church matters.

CHANDLER, William E. See page 893.

CHANDLER, Zachariah, b. N. H., 1813; d. Chicago, 1879. He was educated in a common school and seminary. At the age of 22, he went to Michigan and settled in Detroit, where he became a wealthy and prosperous merchant. He was an early and active member of the whig party, and in 1851 was elected mayor of the city. The next year he was nominated for governor, but was defeated. When the republican party was organized, he took an active part, and was by it chosen U. S. senator in 1856. In the senate he was a firm opponent of all schemes for the extension of slavery, and stood side by side with Benjamin Wade of Ohio, and others who resisted the arrogant tone of the extreme pro-slavery senators. When the civil war broke out, Chandler was one of the foremost in favor of a vigorous prosecution, and had little respect for those whom he denounced as traitors. In 1875, he was defeated for senator, but was at once appointed secretary of the interior, where his business talent soon became manifest in the improved administration of the department. In 1868, and again in 1876, he was chairman of the republican national committee, having the general management of the party canvass. The day before he died he made a powerful speech to a great mass-meeting.

CHANDLER SCIENTIFIC DEPARTMENT. See Dartmouth College.

CHANDORE', a t. and fort in the district of Nassick (q.v.), presidency of Bombay, its lat. and long. being 20° 20′ n. and 74° 14′ east. C. is a flourishing place, with a pop. of (1872) 5,662. The fort, which commands an important pass on the route between Candeish and Bombay, is situated on the summit of a hill naturally inaccessible everywhere but at the gateway. It surrendered to the British in 1804; and being subsequently restored to Holkar, was finally ceded by him in 1818.

CHANDOS CLAUSE. During the discussion of the clauses of the reform bill (q.v.) in 1831, the marquis of Chandos (tory), afterwards duke of Buckingham, proposed the insertion of a clause giving the county franchise to *tenants at will* occupying lands for which they paid an annual rent of £50. This was opposed by the ministers on the ground that the class proposed to be enfranchised would be subject to the coercion of the landowners, who would thus virtually determine the elections. The amendment, however, was supported by many of the radicals, who at that time regarded any extention of the suffrage as a boon, and was carried by a majority of 84. The clause was incorporated in the bill of the following year, and was finally carried by a majority of 272 to 32. The result proved a material accession to the conservative element in counties. Under the reform act of 1867, occupants of lands of a rateable value of £12 are entitled to the county franchise.

CHANDPOOR', a t. of British India, in the n.w. provinces, district of Bijnour, about 930 miles n.w. of Calcutta, and 80 n.e. of Delhi. It is of considerable size, and has a p. (1872) of 12,033.

CHANFRON. See Charger.

CHANGARNIER, Nicolas Anne Théodule, a French general, was born at Autun in 1793—and received his education at the military school of Saint-Cyr. In 1830, he went as lieut. to Algeria, where he distinguished himself, and rose to the rank of gen. of division. After the proclamation of the republic in 1848, he was appointed governor-general of Algeria, in the room of Cavaignac; but being chosen a member of the national assembly, he returned to Paris, when he was appointed commander-in-chief of the garrisons of Paris and of the national guard. He held this double office till the middle of May, 1849, and again for some time after the insurrectionary movement of June of that year. C. was a member of the legislative assembly, where he held a sort of neutral position between the orleanists and legitimists and opposed to the bonapartists. At the *coup d'état* in December, 1851, after being imprisoned in Ham, he went into exile till the Franco-Prussian war, when he offered his services to Napoleon III. He was in Metz with Bazaine; and, on its capitulation, retired to Brussels. He returned to France in 1871, entered the assembly, and assisted M. Thiers in reorganizing the army. He died in February 1877.

CHANG-CHOW-FOO, a city of China, and capital of a department of the same name, in the province of Fuh-keen, in 24° 31′ n. lat., and 1° 24′ long. e. of Pekin.

CHANG-CHOW-FOO, or Chaou-chow, a city of China, and capital of a department of the same name, in the province of Keang-su, in 31° 50′ n. lat., and 3° 24′ long. e. of Pekin.

CHANGELING. It was at one time a common superstition, that infants were taken from their cradles by fairies, who left instead their own weakly and starveling elves. The children so left were called *changelings*, and were known by their peevishness, and their backwardness in walking and speaking. As it was supposed that the fairies had no power to change children that had been christened, infants were carefully watched until such time as that ceremony had been performed. This superstition is alluded to

by Shakespeare, Spenser, and other poets; and it has not yet quite died out of some of the rural districts in Britain.

CHANG-SHA-FOO, a city of China, capital of the province of Hoo-nan, in 28° 20′ n. lat.

CHANK-SHELL, the popular name of the shell of several species of *turbinella*, a genus of gasteropodous mollusks of the group *siphonostomata* (q.v.), natives of the East Indian seas. These shells are obtained chiefly on the coasts of the s. of India and Ceylon, and form a considerable article of trade to Calcutta. They are much used as ornaments by Hindu women, the arms and legs being encircled with them; and many of them are buried with the bodies of opulent persons. Those which are thrown up on the beach, after the death of the mollusk, and have become whitened, are little valued, but fresh shells readily find purchasers. The commercial returns show an exportation of chank-shells from Madras amounting to 2,460,727 in one year, 1853–54, the value of which was about £10,000. The quantity ordinarily exported is smaller. A chank-shell opening to the right is rare, and is highly prized in Calcutta, so that a price of £50, or even £100, is sometimes paid for one.

CHANNEL, English—the *mare Britannicum* of the ancients—is that arm of the Atlantic ocean which divides England from France, gradually narrowing to the strait of Dover. It is often called simply the channel; and the fleet stationed in it for the protection of the English coast, the channel fleet. The greatest river which falls into it is the Seine. It forms bays both on the English and on the French coast; but the larger ones are those on the French coast, whilst the best harbors are on the English.

CHANNEL ISLANDS, a group of islands belonging to Great Britain, lying off the n.w. coast of France, between Normandy and Brittany. They are about 120 m. s.w. of Southampton, and the nearest distance from the French coast is about 10 miles. The C. I. are the only parts of the dukedom of Normandy now belonging to the English crown, to which they have been attached since the conquest. King John, about the year 1200, lost all Normandy, except these isles. The chief islands of the group are Jersey, Guernsey, Alderney, and Sark. The area of the whole is 112 sq.m., and the pop. in 1871 was 90,596. They are more particularly described under Jersey.

CHANNING, Edward Tyrrel, ll.d., 1790–1856; brother of William Ellery Channing, d.d.; a lawyer of Boston who devoted his attention chiefly to literature. In 1817 to 19, he edited the *North American Review*, and was a regular contributor to it through a large part of his life. He was professor of rhetoric and oratory in Harvard college until 1851. A volume of his lectures has been published.

CHANNING, Walter, 1786–1876; a physician, native of Rhode Island, brother of William Ellery Channing, d.d. He studied medicine in Boston and Philadelphia, and in Edinburgh and London. In 1815, he was professor of obstetrics and medical jurisprudence in Harvard, resigning in 1854. He was also for 20 years physician of the Massachusetts general hospital. Among his writings are *Etherization in Childbirth; A Physician's Vacation, or a Summer in Europe; Professional Reminiscences of Foreign Travel; Old and New; Reformation of Medical Science;* and a volume of poems.

CHANNING, William Ellery, d.d., a celebrated Unitarian preacher and author, was b. 7th April, 1780, at Newport, R. I., in the United States, entered Harvard university at the age of 14, and took his degree in 1798. In 1803, he was ordained minister of a church in Boston. During the earlier years of his ministry, his theological peculiarities had little prominence in his discourses, and in consequence he stood upon friendly terms with his brethren in more orthodox churches. In 1819, however, he preached a sermon at the ordination of the Rev. Jared Sparks, in which he advocated the Unitarian doctrine with so much zeal and ability, that he was termed the "apostle of Unitarianism." This involved him in controversy, a thing which he naturally loathed. Nevertheless, to the end of his life, he preserved a devoutly Christian heart, shrinking with the delicate instinct of a pious nature from everything cold, one-sided, and dogmatic, whether Unitarian or Trinitarian. As late as 1841, he wrote. "I am little of a Unitarian, have little sympathy with the system of Priestley and Belsham, and stand aloof from all but those who strive and pray for clearer light." It 1821, he received the title of d.d. from Harvard university, on account of the high talent he had exhibited in his tractate on the Evidences of Christianity, his Address on War, and his Sermons. In 1822, he visited Europe, and made the acquaintance of several great English authors, such as Wordsworth and Coleridge, both of whom were strongly impressed in his favor. Coleridge said of him: "He has the love of wisdom and the wisdom of love." In 1823, he published an *Essay on National Literature;* in 1826, *Remarks on the Character and Writings of John Milton;* in 1829, the *Character and Writings of Fénelon;* in 1835, a work in opposition to *Negro Slavery;* and in 1838, an essay on *Self-Culture.* Besides these, he wrote a variety of other essays and treatises, all characterized by vigor, eloquence, pure taste, and a lofty tone of moral earnestness. He died Oct. 2, 1842, at Bennington, Vt. An interesting memoir of him has been published by his nephew, William Henry Channing (3 vols., London, 1848).

CHANNING, William Ellery, b. Mass., 1818, a son of Dr. Walter Channing. He studied in Harvard, but did not graduate. In 1839, he went to Illinois, and

in 1840 to Cincinnati, where he was for a time connected with the *Gazette.* In 1844–45, he was one of the editorial corps of the *New York Tribune;* visited Europe soon afterward, and in 1855 became one of the editors of the *Mercury* of New Bedford. He has published three volumes of verse, and, in prose, *Conversations in Rome* and *Thoreau, the Poet-Naturalist.*

CHANNING, William Henry, b. Mass., 1810; nephew of William Ellery Channing, D.D. He graduated at Harvard in 1829, at Cambridge divinity school in 1833, and was ordained in charge of a Unitarian church at Cincinnati in 1835. After filling several pastorates in this country he succeeded James Martineau as minister of the Hope street Unitarian chapel, Liverpool, England. On the commencement of the rebellion he returned and took charge of the Unitarian church in Washington. He was one of the early supporters of the socialistic movement in this country, was editor of *The Present* and *The Harbinger*, and in 1848 presided over a socialistic association in Boston. He has been a prolific writer, contributing to the *North American Review*, *The Dial*, *The Christian Examiner*, and other serials. Among his larger works are a translation of Jouffroy's *Ethics; Memoir of William Ellery Channing; Memoirs of the Rev. James H. Perkins; Memoirs of Margaret Fuller Ossoli;* and a work on *The Christian Church and Social Reform.* He d. 1884.

CHANT (see Ambrosian Chant, and Gregorian Chant, *ante*), a modification between singing and recitative especially used for litanies and psalms in the Roman Catholic and Protestant Episcopal service. The chant is the ancient style of church-song, certainly as old as Christianity, which seems to have inherited it from the Jewish church. St. Paul exhorts believers to sing (to chant) psalms and hymns and spiritual songs; and Pliny the younger mentions the early morning assembling of Christians to chant hymns to Christ. As rhymed and metrical hymns, now so common, were the product of a later art, so the tunes accompanying them are modern as compared with chants. Chanting, commended by its grand simplicity, is growing in favor.

CHANTAL, Jeanne Françoise Frémiot, 1572–1641; a daughter of the president of the parliament of Dijon. Her husband was killed in hunting, whereupon she took the vows of celibacy, and devoted herself to the education of her children and the care of the sick and poor. She was, under the direction of St. François de Sales, the founder of the order of the visitation at Annecy. She was canonized in 1767. One of her sons was the father of Madame de Sevigné.

CHANTILLY, an estate in Fairfax co., Va., 20 m. w. of Washington, where, Sept. 1, 1862, a battle occurred between the right of the union army under Pope and the confederates under Jackson. The battle continued, in spite of a severe thunder-storm, until dark, but without important results. The unionists suffered the loss of two generals killed, Philip Kearny and Isaac I. Stevens.

CHANTILLY, a t. of France, in the department of Oise, about 23 m. n.n.e. of Paris. Being one of the most beautiful places in the vicinity of the metropolis, it attracts thence immense numbers of visitors. Apart from its natural beauty, it is interesting as the place where the great Condé spent the latter years of his life in the society of such men as Boileau, Racine, and Bossuet. The magnificent château in which he resided was pulled down at the revolution of 1793; but a lesser château, one of the finest specimens of the renaissance in France, still remains. The park and grounds are very charming. C. is also noted for its extensive manufacture of the *blonde* lace. Pop. (1876) 3,476.

CHANTREY, Sir Francis, an eminent English sculptor, was b. at Jordanthorpe, in Derbyshire, on 7th April, 1781, not 1782, as has been generally said. His father, who was a carpenter, and rented a small farm, died when C. was only 12 years of age, leaving his mother in narrow circumstances. It is said that she gave him "as liberal an education as her limited means would admit;" but much cannot be meant by the phrase, if it be true, as asserted by Holland in his *Memorials*, that his attendance at the little lane-school was very irregular, and that "for a while he certainly drove an ass daily, with milk-barrels, between Norton and Sheffield." C.'s mother married a second time, and the boy was, in 1797, apprenticed for 7 years to a carver and gilder in Sheffield called Ramsay. It was in this humble department that C. acquired the rudiments of his future art. It was during this period that his first attempts at modeling in clay were made, and that by the help of casts taken from the faces of his fellow-apprentices and his own, he began the work of portraiture, in which his great eminence ultimately consisted. C.'s apprenticeship was canceled two years before its expiry; but his subsequent career is not very accurately known. It is certain that he visited both London and Dublin in 1802, probably in the capacity of a journeyman carver and gilder; and in that year he seems to have received instruction as a pupil of the royal academy. It was probably then that he commenced seriously to prepare himself for the work of his future life. In the earlier part of his career as an artist, C. is said to have been under great obligations to Nollekens, who had the shrewdness to see, and the generosity to see without envy, his great promise in the branch in which he himself was eminent. In 1816, C. was elected an associate, and in 1818 a member of the royal academy; and in 1819 he visited Italy for the first time. Like the lives of many other eminent men, that of C. presents few claims on our interest after his early struggles were ended. As an ideal

artist, he never attained a high rank, and, in comparison with Flaxman, he possessed little reputation in this country and none abroad. But he executed, with much truth to nature, as it presented itself to his eye, an endless variety and almost countless number of works of individual portraiture, so that there is scarcely any town of importance in Great Britain which cannot show specimens of his skill. As a result of his diligence in this department of art, C. accumulated a very considerable fortune, the greater part of which, after providing for his widow, he bequeathed for artistic purposes. In this respect, he formed a remarkable contrast to Flaxman, whose modest savings were sworn under £4,000; whilst Nollekens, whose name is almost forgotten, realized the enormous sum of £150,000, it is even said £200,000. C. died childless on the 25th Nov., 1841, and was buried in a tomb prepared by himself at Norton. Lady C. died in Jan., 1875, and the interest of her husband's gift to the royal academy, amounting to about £3,000 a year, is now at the disposal of the council, for the "promotion of British art."

CHANTRY (Fr. *chantererie*, from *chanter*, to sing). The term C. is applied alike to endowments or benefices, to provide for the chanting of masses, and to the chapels in which the chanting takes place. These endowments were commonly made in the form of testamentary bequests, the object being to insure the erection of a chapel near or over the spot where the testator was buried, and to remunerate the priests for saying masses in it for the benefit of his soul, or of the souls of others named in his will. Many such chantry chapels are still to be seen in English parish churches; but they were more common in abbeys and monastic establishments, in which it was considered a privilege to be buried, and where some such offering to the brotherhood was, in a measure, the price of sepulture. These chapels, which have generally the tomb of the founder in the middle of them, are separated from the aisles or nave of the church by open screen-work, a circumstance which has sometimes led to their being called chancels (q.v.). Sometimes, again, they are separate erections, projecting from the church externally; but in cathedrals and the larger churches they are generally constructed within the church, often between the piers. Many chantries are lavishly enriched with sculpture and tracery of all descriptions, and some of them are adorned with gilding and painting.

CHANZY, Antoine Eugène Alfred, b. 1823; a French gen. who first served as an apprentice in the navy. In 1843, he graduated from the Paris military school as sub-lieut. of zouaves. He served in Algeria, Italy, and Syria, and again in Algeria. In 1868, he became gen. of brigade, and early in the Franco-Prussian war he rose to commander-in-chief of the second army of the Loire. During the supremacy of the commune, he narrowly escaped death. In 1872, he was elected to the national assembly, where he acted with the left-center party. In Dec., 1875, he was chosen senator for life, and in 1878 received the grand cross of the legion of honor. He d. 1883.

CHA'OS signified, in the ancient cosmogonies, that vacant infinite space out of which sprang all things that exist. Some poets make it the single original source of all; others mention along with it Gæa, Tartaros, and Eros. By some also only the rough outlines of heaven and earth were supposed to have proceeded from C., while the organization and perfecting of all things was the work of Eros. Still later cosmogonists, such as Ovid, represent it as that confused, shapeless mass out of which the universe was formed into a *kosmos*, or harmonious order. Hesiod makes C. the mother of Erebus and Nox.

CHAOS or **BIRD ISLANDS,** is the name given to several rocky islets situated at the entrance of Algoa bay, South Africa, about 35 m. e. of Port Elizabeth. It was on one of these islands that Bartholomew Diaz, the navigator, died in 1500.

CHAOU-CHOW-FOO, a city of China, and capital of a department of the same name, in the province of Kwang-tung, in 23° 36′ 6″ n. lat., and 0° 46′ 40″ long. w. of Pekin.

CHAOU-KING-FOO, a city and capital of a department of the same name, in the province of Kwang-tung, 50 m. w. of Canton, in 23° 4′ 48″ n. lat., and 4° 24′ 30″ long. w. of Pekin.

CHAPA'LA, the largest lake in Mexico, containing about 1300 sq.miles. It is about lat. 20° 20′ n., and ranges in w. long. from 102° to 103° 25′. It is merely an expansion of the Rio Grande de Lerma, which enters the Pacific at San Blax. C. lies on the table-land of Anahuac, and has many islands.

CHAP BOOKS, the name given to a variety of old and scarce tracts of a homely kind, which at one time formed the only popular literature. In the trade of the bookseller, they are distinguishable from the ordinary products of the press by their inferior paper and typography, and are reputed to have been sold by chapmen (see Chapman) or peddlers; hence their designation. The older C. B. issued in the early part of the 17th c. are printed in black letter, and are in the form of small volumes. Those of a later date are in the type now in use, but are equally plain in appearance. Of either variety, they were mostly printed in London; many being without dates. They were of a miscellaneous kind, including theological tracts, lives of heroes, martyrs, and wonderful personages, interpretations of dreams, fortune-telling, prognostications of the weather, stories of giants, ghosts, hobgoblins, and witches, histories in verse, and songs and ballads. See *Notices of Fugitive Tracts and Chap Books*, also *Descriptive Notices of Popular*

English Histories; both by J. O. Halliwell, printed for the Percy society. An inferior class of tracts succeeded these books for the common people, and are best known as *Penny Chap Books.* For the most part they consisted of a single sheet, duodecimo, or 24 pages. Besides the title, the first page usually contained a coarse wood-cut embellishment. The paper was of the coarsest kind adapted for printing, and the price, as the name imports, was a penny each. The subjects besides being of a similar nature to the above, included stories of roguery and broad humor. These penny C B. were issued by an obscure class of publishers in London and several English provincial towns, of which we might particularize Newcastle-on-Tyne. They were also issued from the presses of Edinburgh, Glasgow, Falkirk, and Paisley. It is a curious fact, that nearly all the penny C. B. of this very homely kind which were latterly popular, were written by Dougald Graham, who, previous to his death in 1779, filled the office of bellman or town-crier of Glasgow. The most reputable production of this humble genius was a *History of the Rebellion* in a Hudibrastic meter, which was a great favorite with sir Walter Scott, and is now scarce; see *Chambers's Journal,* first series, vol. x. p. 84; also the *Paisley Magazine* (1829), an extinct publication of great rarity, in which is given a biographic sketch of Dougald Graham, with a list of his productions. In some parts of Scotland and the n. of England, Graham's penny C. B. are still seen on stalls at markets; but the general advances in taste, along with the diffusion of an improved literature, have displaced them in almost all other quarters. Collections of the older C. B. are now found only in the libraries of bibliomaniacs, by whom they have been picked up at extravagant prices from dealers in second-hand books. In various continental countries, there are numerous varieties of C. B. at exceedingly small prices. The French government being desirous to substitute a wholesome class of tracts of this kind for what are generally objectionable on the scoae of taste and morality, have latterly, through commissioners, taken some steps on the subject. See *Histoire des Livres Populaires, ou de la Littérature du Colportage,* by M. Nizard. W. C.

CHAPEL (Fr. *chapelle*), a word derived from *capa,* which originally signified a case, or chest in which were contained the relics of a saint, and afterwards the place where the chest was kept. The term now signifies a building erected for the purposes of public worship, but not possessing the full privileges and characteristics of a church. In this sense, all places of worship erected by dissenters are now called chapels in England, and the term is also applied to supplementary places of worship, even though in connection with the established church—such as parochial chapels, chapels of ease, free chapels, and the like. In former times, it was applied either to a domestic oratory, or to a place of worship erected by a private individual, or a body corporate. In the latter sense we speak of chapels in universities and colleges. But its earliest signification was that of a separate erection, either within or attached to a large church or cathedral, separately dedicated, and devoted to special services. See CHANTRY. Chapels had no burying-ground attached to them, and the sacrament of baptism was not usually administered in them.

CHAPEL HILL, a village in Orange co., N. C., 28 m. n.w. of Raleigh; pop. '80, 3124. It is the seat of the university of North Carolina.

CHAPELLE, LA, the name of several places in France, the most important of which forms a northern suburb of Paris. Chemicals, salt, starch, liquors, etc., are manufactured.

CHAPELLE DE FER. See HELMET.

CHAPERON, a hood or cap worn by knights of the garter. Such a hood was at one time in general use, but was lately appropriated to doctors and licentiates in colleges. A person who acts as a guide and protector to a lady at public places, is called a C., probably from this particular piece of dress having been used on such occasions. The name was also applied to devices which were placed on the heads of horses at pompous funerals.

CHAPIN, AARON LUCIUS, D.D., b. Conn., 1817; a graduate of Yale, and Union (N. Y.) theological seminary. In 1838, he was a professor in the New York institution for the deaf and dumb. In 1844, he became pastor of the First Presbyterian church in Milwaukee, Wis.; and in 1850, was chosen first president of Beloit college, an office which he still holds. He was for some years one of the editors of the *Congregational Review.*

CHAPIN, CHESTER W. See page 893.

CHAPIN, EDWIN HUBBELL, D.D., 1814–1880, b. Washington co., N. Y.; educated at a seminary in Bennington, Vt., and commenced preaching in Richmond, Va., to a congregation of Unitarians and Universalists. In 1846, he went to Massachusetts, and in 1848, to New York, where he became minister of the Fourth Universalist church. He has ever since remained over this congregation, which, from a small beginning in the lower part of the city, has grown to rank among the largest, occupying a prominent church edifice in Fifth avenue, known as the Church of the Divine Paternity. Besides his regular sermons he has delivered a great number of lectures, and has published several volumes, among which are *Duties of Young Men; Duties of Young Women; Characters in the Gospels; Communion Hours; Discourses on the Lord's Prayer; Crown of Thorns;*

The Beatitudes; Moral Aspects of City Life; True Manliness; and *Discourses on the Book of Proverbs;* besides sermons. His useful and honored life closed, 1880.

CHAPIN, HENRY. See page 893.

CHAPLAIN was originally the title of the ecclesiastic who accompanied an army, and carried the relics of the patron saint. See CHAPEL. It has now come to signify a clergyman not having charge of a parish, but employed to officiate at court, in the household of a nobleman, or in an army, garrison, ship, etc. Such officials began early to be appointed in the palace of the Byzantine emperors. The practice afterwards extended to the western empire, and to the courts of petty princes and even of knights, and continued to subsist after the reformation. Forty-eight clergymen of the church of England hold office as chaplains of the queen in England, four of whom are in attendance each month. Six clergymen of the church of Scotland have a similar title in Scotland; but their only duty is to conduct prayer at the elections of Scottish representative peers. A statute of Henry VIII. limits the right of nominating private chaplains in England: thus, an archbishop may have eight, a duke six, a baron three; and chaplains so appointed have certain privileges, and may hold two benefices with cure of souls.

An ARMY CHAPLAIN is a clergyman whose services are retained especially by the government for the soldiery of the army. There have been such chaplains for many generations, and the office was at one time regarded as a salable perquisite; but the system was reorganized and improved in 1796. In recent years, Roman Catholic and Presbyterian chaplains have also been appointed, a practice which indicates the progress of toleration. The chaplains belong, not to *regiments*, but to the staff of the army, so as to be generally available. At home, they are attached to the military stations; but in the field they are located at headquarters, at the hospitals, and with the divisions. The officers at the stations usually arrange for the men to attend divine service at the nearest parish church; but this still leaves the chaplains many duties to fulfill. Where, as sometimes happens, there is no regular church or chapel near at hand, the C. reads and preaches to as many men as can conveniently group themselves around him at one time, and thus serves many different congregations at different times of the Sunday. He visits the sick at the hospitals, and examines and encourages the regimental schools. Among the wooden huts at Aldershott camp, a church has been built, which is rendered available for chaplains of different religious denominations in succession.

When the system of army-chaplains was remodeled in 1796, a *chaplain-general* was appointed; this office was abolished by the duke of Wellington soon after the termination of the great war, but revived by Mr. Sidney Herbert in 1846. The C.-gen., who receives £1000 per annum, has duties partaking somewhat of those of an archdeacon. He assists the war office in selecting chaplains, and in regulating the religious matters of the army, so far as church of England matters are concerned. His office forms one of the 8 departments under the new organization of the war office. There are 78 chaplains on the staff, besides officiating clergymen (not belonging to the army), and chapel-clerks. The commissioned chaplains receive from 10*s.* to 22*s.* 6*d.* per day, besides allowances; and there are always some on half-pay; while the officiating clergymen receive head-money for the troops attending their ministrations. The whole expenditure for chaplains, and other charges connected with divine service, figures in the army estimates at near £50,000 annually.

NAVY CHAPLAIN. Every ship in commission, down to, and including fifth-rates, has a chaplain. The navy estimates provide for above 80 commissioned chaplains, at stipends varying from £219 to £401 per annum. The chaplains perform divine service at stated times on shipboard, visit the sick sailors, and assist in maintaining moral discipline among the crews.

CHAPLAIN (*ante*), in the United States officially known only as the chaplain of the senate and of the house of representatives, and in the army and the navy. In some of the states there are chaplains for one or both of the legislative bodies. In the army there are both post and regimental chaplains; and there is usually a chaplain in every regiment of militia, though they are not always ordained clergymen. In the navy there are a certain number of chaplains, according to the number of vessels in commission. It is usual, also, to appoint chaplains to state prisons, to reformatory institutions, and to asylums. Where there are radical differences of religious belief to any considerable extent, as in the institutions of New York city, chaplains of Protestant, Roman Catholic, and Jewish faith are employed or permitted to officiate.

CHAPLET, a garland or head-band of leaves and flowers. In heraldry, a C. is always composed of four roses, the other parts being leaves.

CHAPLIN, JEREMIAH, D.D., 1776–1841; a native of Massachusetts, graduated at Brown university, and for some years a tutor there. He was for 16 years pastor of a Baptist church in Danvers, Mass., and from 1820–32 president of Waterville college.

CHAPMAN, a trader, but popularly applied in a more limited sense to a dealer in small articles, who travels as a peddler or attends markets. C. is from *chap,* equivalent to *cheap,* a word which in its origin signified a market or place for trading; hence *Cheapside, Eastcheap.* See CHAP BOOKS.

CHAPMAN, GEORGE, dramatist and translator, was b. in 1557, educated at Cambridge and Oxford, and was the cotemporary and friend of Spenser, Jonson, and Shake-

speare. His first play, entitled *The Blind Beggar of Alexandria*, was printed in 1598 Up to 1620, he supplied the theater with tragedies and comedies, and some of these, after the fashion of the time, were written in conjunction with other dramatists. As a writer for the stage, C. does not rank high. Despite many nervous passages, his plays want the irradiation of a constant genius, and his characters are unnatural. His translation of Homer is the most vigorous that has yet been executed in England, and in reading it, many have felt with Keats—

> Like some watcher of the skies
> When a new planet swims into his ken.

C. seems to have led a long, temperate, and happy life, unblasted by poetic fire. He died in 1634. Swinburne, the poet, published an edition of C.'s works, with a critical introduction, in 1875.

CHAPMAN, James, A. M., D.D., b. N. H., 1830; graduated at Waterville college, and in 1855 became a Methodist minister. He has occupied pulpits in several New England towns, in Boston, and in Brooklyn, N. Y.

CHAPMAN, John Gadsby, b. Va., early in this century. He studied art in Rome, and returned to New York, where he had a studio, but not long afterwards went back to Rome, where he now resides. Among his paintings are "The Baptism of Pocahontas" (for the capitol in Washington); "An Etruscan Girl;" "The Israelites Spoiling the Egyptians;" "The First Italian Milestone;" "A Donkey's Head;" and "The Last Arrow."

CHAPPE, Claude, 1763–1805; an engineer, and the inventor of the first working telegraph of any importance. His invention consisted of an upright post, on the top of which was fixed a transverse bar, and at the ends of the bar two smaller arms movable on pivots. The position of the bars represented letters or words; and by means of such machines placed at remote but easily visible points, messages were conveyed fifty leagues in a quarter of an hour. Until almost the period of electric telegraphy, the machine was used especially for noting the arrival of ships. C. was so much annoyed by charges that he had copied his invention from others, that he committed suicide.

CHAPPED HANDS and **CHILBLAINS**, a lesser and a greater form of disease of the skin, produced by undue exposure to extremes of cold and heat, and affecting chiefly the most exposed joints, the skin over which swells and cracks, with itching, pain, and heat; in the most severe cases there is ulceration, which is difficult to heal in proportion to the length of time the disease has been neglected. Chilblains may generally be avoided if the hands are washed always with tepid water, and not habitually exposed to great cold, or when cold, to the heat of a fire. When formed, they may be treated with oxide of zinc ointment; or with a dilute solution of borax in glycerine and water; or with glycerine alone, slightly diluted with water; the hands being in any case habitually covered with woolen gloves in cold weather.

CHAPSAL, Charles Pierre, 1787–1858; a French grammarian, joint author (with François Joseph Noel) of the *Nouvelle Grammaire Française, avec Exercices*, one of the most widely adopted of all grammars of that language. The proceeds of the book gave him a fortune, much of which was given to charities, among which was one bequest of 80,000 francs to the teachers in the environs of Paris.

CHAPTAL, Jean Antoine, 1756–1832, count of Chanteloup, a French chemist and statesman. He was professor of chemistry at Montpellier, where he taught the doctrines of Lavoisier instead of those of Stahl. By the death of an uncle, C. acquired capital, which he employed in manufacturing mineral acids, alum, white lead, soda, and other chemical wares. After the revolution of Nov. 9, 1799, he was made a councilor of state by Napoleon, and succeeded Lucien Bonaparte as minister of the interior, in which capacity he established a school of arts, and a society of industries. He also reorganized the hospitals, introduced the metrical system of weights and measures, and otherwise greatly encouraged arts and sciences. On Napoleon's return from Elba, C. was made director-general of commerce and manufactures, and minister of state. The downfall of the empire sent C. to private life, but he kept his interest in science, and in 1816 was named member of the academy.

CHAPTER-HOUSE (Fr. *chapitre*), the building in which the monks and canons of monastic establishments, and the dean and prebendaries of cathedral and collegiate churches, meet for the management of the affairs of their order or society. See Cathedral. Chapter-houses frequently exhibit the most elaborate architectural adornment, as, for example, those at York, Southwell, and Wells. The original stained-glass windows remain at York, and are of exquisite beauty. On the walls of that at Westminster, the original painting has been discovered. Chapter-houses are of various forms: those at York and Westminster are octagonal; those at Oxford, Exeter, Canterbury, Gloucester, etc., are parallelograms; Lichfield is an oblong octagon; Lincoln, a decagon; and Worcester, a circle. They are always contiguous to the church, and are generally placed to the west of the transepts. They generally either open into the church, or are entered by a passage. Chapter-houses were often used as places of sepulture, and have sometimes crypts under them, as at Wells and Westminster.

CHAPU, a maritime t. in the province of Che-keang, China, 50 m. n.w. of Chinhai, in one of the richest districts in the country. It is the port of Hang-Chow, with which it has canal communication, and it was formerly the only Chinese port trading with Japan. It is about 5 m. in circuit, exclusive of the suburbs. It was attacked and much injured by the British, who captured it in 1842, but it was immediately abandoned by them.

CHAPUL'TEPEC, a fortress on a mound of rock about 200 ft. high, 2 m. s.w. of the city of Mexico. In the war with the United States this fortress, one of the chief defenses of the city of Mexico, was taken (Sept. 12, 1847) by gen. Scott, and the city itself was captured the next day.

CHARA'CEÆ, aquatic plants, forming, according to some botanists, a distinct natural order of acotyledonous plants; according to others, a sub-order of *algæ.* Their stems are tubular, consisting either of a single tube, or of parallel tubes, a central one with smaller ones applied to its surface; they are either pellucid or incrusted with carbonate of lime, which is not to be regarded as a mere accidental incrustation, but belongs to their proper structure; and they have whorls of symmetrical tubular branches. They grow in stagnant waters, both fresh and salt, are always submersed, and often completely conceal muddy bottoms. A number of species are natives of Britain, all belonging to the genus *chara.* The organs of reproduction are of two kinds—lateral *globules,* and axillary *nucules.* These organs have caused no little difficulty to botanists; the nature and use of the globules in particular being by no means well understood. The simple cellular structure of the C., apart from all consideration of their reproductive organs, associates them with the lower algæ, rather than with phanerogamous plants. None of them is of any known use. It was in the C. that the beautiful phenomena of *cyclosis* (q.v.) were first observed. Sir David Brewster discovered that each of the minute calcareous particles incrusting the C. possesses double refraction, and has regular neutral and depolarizing axes.

Fossil Characeæ.—The calcareous incrustation which covers the organs of reproduction, as well as the stems of some C., has, from its power of resisting decomposition, caused the abundant preservation of this order in the tertiary fresh-water strata. The nucules originally described under the name of *gyrogonites,* and supposed to be foraminiferous shells, have been noticed by E. Forbes in strata as old as the middle Purbeck beds. No remains of these have been observed in newer deposits, until we find them in the tertiaries. The nucules, associated with *lymnæa* and *planorbis,* are very abundant in the eocene Bembridge beds (q.v.).

CHARACIN'IDÆ. See SALMONIDÆ.

CHARACTER (Gr. *charasso* or *charatto,* which signifies to scrape, cut, or engrave) means what is engraven on an object, either physically by the action of another external object or objects, or morally by the passions, the affections, by good or evil fortune, and by what we designate generally as "circumstances." In art, the expression of C., either in animate or inanimate objects, is, after correct delineation, the most important matter to be attended to. Though, properly speaking, all distinguishing marks are included under it, it is more generally used to designate those which mark individual from individual, than species from species, or genus from genus.

CHARACTERISTIC. See LOGARITHMS.

CHARACTER TO SERVANT. The master is under no legal obligation, either in England or in Scotland, to give a character to his servant, however long, faithfully, or efficiently he may have served him; the duty of bearing testimony in his favor being one which, however binding in morality, it has not been found convenient to enforce by positive law; but, if given, the character must be strictly true, or, at all events, in accordance with the master's belief, otherwise he may be exposed to an action of damages, either by the servant whom he has calumniated, or by a subsequent employer whom he has deceived. If true, however, the fact of its being prejudicial will expose the master to no risk. In order to justify the giving of a bad character, however, it must, in general, be asked for by the servant, as the master is not entitled needlessly to publish the servant's defects. In that case, it will lie with the servant to prove its falsehood, not with the master to prove its truth. The case of the servant being known by the master to have committed a felony while in his service, is, however, an exception to this rule, as, in a case so extreme, the master is at liberty to warn others against taking him into their employment. Even though strictly true, the character, if prejudicial, must not be more so than the circumstances render necessary. Acts of petty dishonesty, such as are too common amongst servants, will not warrant the master in branding him as a thief. The safe course, in such a case, is to state the offense, and not to describe it by a general epithet, which may convey an erroneous impression of its magnitude.

It is probable that, partly from thoughtless good-nature, and partly from a selfish desire to get rid of a bad servant in the most comfortable manner, false characters are given in favor of servants very much more frequently than to their prejudice. It is desirable that masters and mistresses should have in view that they may render themselves liable in reparation of any damage which can be shown to be the direct result of

thus inflicting on a stranger a wrong which is unquestionably within the reach of the law.

By 32 George III. c. 56, personating a master, and thus giving a false character to a servant, or asserting in writing that a servant has been hired for a period of time, or in a station, etc., contrary to truth; and any person offering himself as a servant, pretending to have served where he has not served, or producing a false certificate, or altering a certificate, or pretending not to have been in any former service, etc., are offenses at common law, punishable on conviction before two justices with a fine of £20. This statute does not extend to Scotland.

CHARADE, or "syllable-puzzle" as the Germans call it, is an amusement which consists in dividing a word of one or more syllables into its component syllables, or into its component letters, predicating something of each; and then, having reunited the whole, and predicated something of that also, the reader or listener is asked to guess the word. As a specimen of the C. depending upon syllables, we adduce the following:

"My *first* is plowed for various reasons, and grain is frequently buried in it to little purpose. My *second* is neither riches nor honors, yet the former would generally be given for it, and the latter are often tasteless without it. My *whole* applies equally to spring, summer, autumn, and winter; and both fish and flesh, praise and censure, mirth and melancholy, are the better for being in it. Ans. *Sea-son*."

As a specimen of the second class of charades, we take the following happy example from the French:

"Quatre membres font tout mon bien,
Mon dernier vaut mon tout, et mon tout ne vaut rien."

The word is *zero*. It is composed of four letters, of which the last—viz., *o*, is equal to *zero;* the whole, zero itself, being equal to nothing.

But besides charades of this nature, there is another kind rather popular at evening-parties—the *acted* C.: the character of which is entirely dramatic. Half a dozen or so of the company retire to a private apartment, and there agree to select a certain word, as the subject of the C.; let us suppose INNKEEPER. The next thing done is to take the first syllable, INN, and arrange a little scene and dialogue, each member taking a certain part. This being accomplished, the amateur actors return to the drawing-room, and commence their performance, the rest of the company constituting the spectators. Care is taken to mention conspicuously, and yet not obtrusively, in the course of the dialogue, the word INN, which is the subject of the scene. On its conclusion, they again retire, and devise a new series of incidents for the word KEEPER, generally something in connection with a menagerie or a madhouse. This being also represented, they retire for a third time, to contrive the final scene, into which both words, or rather the whole word, Innkeeper, must be dexterously introduced at an odd moment when the spectators are thought to be off the scent. The company are then asked to guess the word. In order to the effective performance of a C. of this sort, the actors must possess a good share of inventiveness, self-possession, and ready talk, as the greater portion of the dialogue has to be extemporized.

CHARADRI'ADÆ, a large family of birds, of the order *grallatores*, and tribe *pressirostres*, chiefly abounding in the temperate parts of the old world, and generally frequenting sandy unsheltered shores and open moors and downs. They have a short bill, generally soft at the base, hard and often a little inflated towards the tip; long and powerful wings; long legs; and short toes, generally only three in number, and all directed forward, but sometimes they have also a very small hinder toe. They run with great swiftness; they generally congregate in flocks, at least during certain parts of the year; many of them are nocturnal in their habits; many are migratory. The plovers (*charadrius*) have given their name to the family, which includes also lapwings, pratincoles, oyster-catchers, turnstones, sanderlings, etc.

CHARBAR, or CHOUBAR BAY, a harbor in the Indian ocean on the coast of Beloochistan; 25° 16′ n., 60° 35′ east. The town of Charbar at the entrance is garrisoned by the sultan of Oman. Near by are the ruins of the early Portuguese settlement of Tees.

CHARBON ROUGE, or RED CHARCOAL, is a variety of charcoal obtained by subjecting wood to the action of heated air from furnaces, or of steam, which has been raised to a temperature of 572° F. Air-dried wood, by the ordinary process of charring, yields at the best 21 to 26 per cent of black charcoal; but when acted on by heated air or steam, as mentioned above, 36 or 42 per cent of C. R. is obtained. It is now prepared largely in France and Belgium, and is used in stoves for heating, and in the preparation of gunpowder. It has a dark-red color, and consists of about 75 per cent pure carbon, and 25 per cent hydrogen and oxygen.

CHARCAS. See CHUQUISACA, *ante*.

CHARCOAL is a popular term applied to charred wood, or coal produced by charring wood. There are several other varieties of C., however, for which see CARBON, ANIMAL CHARCOAL, WOOD CHARCOAL, COKE, BLACK-LEAD, etc.

CHARCOAL BLACKS are made both from animal and vegetable substances—e.g., burnt ivory, bones, vine-twigs, peach-stones, nut and other shells, the smoke of rosin

condensed, etc. Those which are derived from vegetable substances, when mixed with white, are usually of a blue tint. See LAMP-BLACK.

CHARDIN, Sir JOHN, 1643–1713; a native of Paris, the son of a jeweler, and bred to the same business; but preferring adventure he traveled in Persia and India in 1665–69. Two years later he made a second and more extended journey of four years. In 1681, he settled in London, and was knighted by Charles II. In 1686, he published a portion of the *Travels of Sir John Chardin into Persia and the East Indies*, etc. The complete account of his travels, however, did not appear until 1711.

CHARENTE, a considerable river in the w. of France, rises in the department of Haute-Vienne, about 14 m. n.w. of Chalus. It first flows n.w. to Civray, where it turns southward into the department of Charente to Angoulême, thence it flows westward past Châteauneuf, Jarnac, and Cognac, and entering Charente-Inférieure, it runs n.w. past Saintes, and falls into the Atlantic below Rochefort, and opposite the islands Oléron and Aix. This river gives its name to two departments, both remarkable for the productiveness of their vineyards; but the wines are mostly used in the preparation of brandy and liquors.

CHARENTE, a department of France, formed chiefly out of the old province of Angoumois, and situated in lat. 45° 10′ to 46° 8′ n., and long. 0° 50′ e. to 0° 30′ west. Area, about 2,200 sq. miles. Pop. '81, 367,451. It is generally hilly, and is watered by the river Charente, above noticed, and its tributaries, the Tardouère and the Bandiat, with the rivers Vienne and Dronne. The highest chain of hills in the n. of C. is a continuation of the heights of Limousin, forming the watershed towards the Loire. Remains of marine productions show that the basin of the C. was once filled by the ocean. The soil is mostly limestone, here and there interrupted by banks of clay and gravel. Only a portion of the arrondissement Confolens has a rich vegetable clay-mold. The clay-soil is cool and moist, while the limestone district is dry and hot. The hills are in many places clad with chestnut forests. The climate is generally mild and healthy. The wines grown are spirituous and fiery in flavor, and are chiefly used in the manufacture of Cognac, which forms the most important of the exposts. Truffles grow abundantly in several parts. Industry is in rather a backward condition. C. is divided into the five arrondissements of Angoulême, Cognac, Ruffec, Barbezieux, and Confolens.

CHARENTE-INFÉRIEURE, a maritime department of France, which includes the former province of Angoumois, with the greater part of Saintonge, and a small portion of Poitou. It lies in lat. 45° 5′ to 46° 19′ n. and long. 0° 7′ e. to 1° 13′ west. The bay of Biscay washes its western boundary—the coast-line, which is very broken, measuring about 100 miles. Area, 2,740 sq. miles. Pop. '81, 462,659. It is watered on its boundaries by the Sèvre-Niortaise and the Gironde, and in the center by the navigable Charente and the coast-stream Sendre. The surface is level; and the soil—near the coast, intersected by ridges of rock and sand-banks, and protected from the sea by dikes—is mostly chalky and sandy, but very fertile, producing hemp, flax, saffron, and wine in great quantities. The commerce, facilitated by the structure of the coast, and by canals in the interior, is considerable, consisting chiefly of brandy and sea-salt, which is found in the department in great abundance. The oyster and pilchard fisheries are important. The chief harbors are those of Rochefort and La Rochelle, the latter of which is the chief town. C. is divided into the six arrondissements of La Rochelle, Rochefort, Marennes, Saintes, Jonzac, and St. Jean-d'Angely.

CHARENTON-LE-PONT, a t. of France, in the department of Seine, situated on the right bank of the Marne, 5 m. s.e. of Paris. The bridge over the river, which is important from a military point of view, being considered one of the keys of the capital, and which has frequently been the scene of conflicts, is defended by two forts, forming a part of the fortifications of Paris. At the other side of the river is the national lunatic asylum, formerly called Charenton St. Maurice, and now St. Maurice simply. Pop. '76, 8,744.

CHA'RES, 4th c. B.C., an Athenian general who relieved the Philasians from the siege of the Argives and Arcadians; fought against Oropus; lost the island of Corcyra to Athens; commanded jointly with Chalnas in the social war, and made a successful attack upon Chios, in which Chalnas was killed; led an expedition against and captured Sestos; commanded in Thrace, where his main business was private plundering; and in 338 was one of the Athenian commanders in the battle of Chæronea.

CHA'RES, a Grecian artist in bronze, a native on Lindus, and the designer of the colossus of Rhodes, lived in the 3d c. B.C. He was a pupil of Lysippus.

CHARGE. In the law of Scotland, a C. is a command to perform an act, conveyed in the letters of the sovereign. The same term is applied to a messenger's copy for service, requiring the person to obey the order contained in the letters—e.g., a C. on letters of horning, or a C. against a superior.

CHARGE, in heraldry. The figures represented on a shield are called charges, and a shield with figures upon it is said to be charged (Fr. *chargé*). The charges in a shield ought to be few in number, and strongly marked, both as regards their character and

the mode of their representation. The family shield, belonging to the head of the house, almost always is simpler, i.e., has fewer charges, than the shields of collaterals, or even of junior members.

CHARGE, in military warfare, is a sudden and impetuous attack on the enemy, by horse or foot, or both. Its object usually is to drive the enemy from a particular position; but if made with a much stronger force, it may result in his actual destruction.

CHARGE, in military pyrotechny, is sufficient combustible material for one firing or discharge. It is applicable to all kinds of firings, fireworks, and explosions; but the name is generally given to the quantity of gunpowder requisite for firing off a gun, etc. In cannon, this varies greatly, from $\frac{1}{2}$ to $\frac{1}{16}$ of the weight of the shot; some of the rifled ordnance now coming into use are remarkable for the smallness of the C. with which they are fired. The quota of C. will be mentioned in connection with the various kinds of fire-arms described in the *Encyclopædia.* In breaching a wall, a greater C. is necessary than in attacking a ship or a column of troops, even with the same kind of gun and projectile.

CHARGER is a name sometimes given to a war-horse, accustomed to the din of battles, and reliable under circumstances of confusion and danger. In the middle ages, when armor was used, and gunpowder unknown, the military horses were *barbed* or *barded* when ridden by men-at-arms—that is, they were nearly covered with armor. The face, the head, and the ears were covered with a mask called a *chanfron,* to prevent fright when charging the enemy; and an iron spike projected from the middle of the forehead. The neck was defended by small plates called *crinières;* the breast by a *poitrinal;* and the buttocks and haunches by *croupières.* These various pieces of armor were mostly made of metal, but sometimes of tough leather. The horse was occasionally covered with chain-mail; and in other instances with a *gambeson* of stuffed and quilted cloth. The man-at-arms generally rode another horse when not charging, to relieve the C. from his great burden. The barbed or *bardé* horse received its name from an old French word implying covered, clothed, or armed. A war-horse is still called a C., though not armed as in ancient times.

CHARGÉS D'AFFAIRES are fourth-class diplomatic agents, accredited, not to the sovereign, but to the department for foreign affairs; they also hold their credentials only from the minister, and are sometimes only empowered by an ambassador to act in his absence.

CHARIOT, in ancient times, was a kind of carriage used either for pleasure or in war. According to the Greeks, it was invented by Minerva; while Virgil ascribes the honor to Erichthonius, a mythical king of Athens, who is said to have appeared at the Panathenaic festival founded by him, in a car drawn by four horses. The ancient C. had only two wheels, which revolved upon the axle, as in modern carriages. The pole was fixed at its lower extremity to the axle, and at the other end was attached to the yoke, either by a pin or by ropes. The Greeks and Romans seem never to have used more than one pole, but the Lydians had carriages with two or three. In general, the C. was drawn by two horses. Such was the Roman *biga* (q.v.), but we also read of a *triga,* or three-horse C., and a *quadriga,* or four-horse one. The last was that in which the Roman generals rode during their triumphal entrance into the city, and was often adorned with splendid art. The war-chariot held two persons—the soldier himself and the driver, the latter of whom usually occupied the front; but the chariots used by the Romans in their public games held only the charioteer.

The oldest war-chariots of which we read are those of Pharaoh (Exodus xiv. 7). All the eastern nations used them, while we learn from Cæsar (*De Bell. Gall.,* v. 19) that the Britons also were familiar with their use.

CHARIS'TICARIES, officers (in Greek ecclesiastical history) who had full power over the revenues of hospitals and monasteries.

***CHARITABLE USES** AND LAW OF CHARITIES. The law of England has always anxiously, though too often ineffectually, sought to provide for the preservation and proper application of the public and private endowments in that country for charitable purposes. The preceding efforts of the legislature in this direction may now be said to have been superseded by the charitable trusts acts (16 and 17 Vict. c. 137, 18 and 19 Vict. c. 124, 23 and 24 Vict. c. 136, and 32 and 33 Vict. c. 110). See CHARITY COMMISSIONERS. As these statutes now contain a species of code of charity-law, it will here only be necessary to mention certain general principles which govern the law of England in its relation to charities. The courts of equity are those which in general take cognizance of all charitable uses, or trusts of a public description. Under the authority of these tribunals—or in cases in which the annual income does not exceed £50, in accordance with the act just quoted, under that of the county courts of the district—trustees may be called to account for the funds committed to their charge, or new trustees may be appointed, improvident alienations may be rescinded, schemes for carrying the donor's object into effect may be judicially considered and adopted, and every species of relief afforded which such institutions require. Where the management of the charity has been confided by the donor to governors and other functionaries, the law

will not interfere with their proceedings unless they can be shown to be squandering the revenues or otherwise abusing the trust. Where the crown is founder, the lord chancellor is visitor, but in his personal character only, and not as judge of the court of chancery. As regards the nature of the trusts to which the equitable jurisdiction of the chancery extends, it is necessary to remark that the word *charitable* here includes institutions for the advancement of learning, science, and art, and, indeed, for all useful public purposes, as well as for the support of the poor. It also comprises all donations for pious and religious objects, under which are included all those which tend to the benefit of the church of England, or of any body of dissenters sanctioned by law. Roman Catholics were admitted into this category by 2 and 3 Will. c. 115, and Jews by 9 and 10 Vict. c. 59, s. 2. The charity or other benevolent purpose, however, must be public; "for if a sum of money be bequeathed, with direction to apply it to such purposes of benevolence and liberality as the executor shall approve," or even "in private charity," the law will take no notice of such a trust.

Legacies to pious or charitable uses are not by the law of England entitled to a preference, though such was the doctrine of the civilians; but where a deficiency of assets arises, they are abated in proportion with the others. See *Supp.*, page 893.

CHAR'ITON, a co. in n. central Missouri, lying n. and e. of the Missouri and w. of Grand river, and intersected by the North Missouri railroad; 740 sq.m.; pop. '80, 25,224—3958 colored. The surface is rolling prairie and forest, with fertile soil. Coal and limestone are found. Chief productions, wheat, oats, corn, hay, tobacco, and butter. Co. seat, Keytesville.

CHAR'ITON, or GRAND CHARITON, a river rising in s. central Iowa, and flowing s.e. into Missouri, thence s. joining the Missouri river in Chariton co.; 250 m. long, and navigable about 50 miles.

CHARITY, SISTERS OF. See SISTERS OF CHARITY.

CHARITY COMMIS'SIONERS. A body of commissioners was created in 1853, by the charitable trusts act, 16 and 17 Vict. c. 137 (see CHARITABLE USES), with power to inquire into all charities in England and Wales, with reference to their nature, objects, and administration, and the amount and condition of the property belonging to them. The commissioners have power to call for the production of accounts and documents from trustees, and to appoint inspectors to visit and report on their management. The statute does not extend to Scotland or Ireland, to the English universities, or to the city of London. An annual report of their proceedings must be laid before parliament by the commissioners.

CHARIVARI is a French term used to designate a wild tumult and uproar, produced by the beating of pans, kettles, and dishes, mingled with whistling, bawling, groans, and hisses, and got up for the purpose of expressing a general dislike to the person against whom it is directed. The etymology of C. is obscure; the Germans translate it by *Katzenmusik*, the English of which is *caterwauling*. In France, during the middle ages, a C. was generally raised against persons contracting second nuptials, in which case the widow was specially assailed. On these occasions, the participators in it, who were masked, accompanied their hubbub by the singing of satirical and indecent verses, and would not cease till the wedding couple had purchased their peace by ransom. C. answers to the English concert upon "marrow-bones and cleavers," with which it was customary to attack a married couple who lived in notorious discord. It was also got up against an unequal match, such as where there was great disparity in age between the bride and bridegroom.

Similar customs seem to have existed under different names in all parts of Europe, and sometimes they were of such a licentious and violent character as to require military interference to put them down. Even as early as the 14th c., the church found itself forced to threaten punishment, and even excommunication, against those who participated in them. In more recent times, the C. has taken a purely political coloring; as, for example, during the restoration in France, at which time, however, the popular voice began to seek vent by casting its satirical darts against public men through the press. The papers published for this purpose were called C., the most famous among which is the *Charivari*, which was established in Paris, Dec. 2, 1832, corresponding to the English publication, *Punch* (q.v.).

CHARKOV'. See KHARKOV.

CHARLATAN, a mountebank, quack-doctor, or empiric, and hence any one who makes loud pretensions to knowledge or skill that he does not possess. The word seems to be derived from the Ital. *ciarlare*, to babble or talk, the chief art of the C. consisting in talk. Charlatanism abounds in all departments of life, and manifests itself in various ways according to the subject and character of the person. It changes also in form with the spirit of the time. The medical C. no longer appears on a stage in the guise of Dr. Ironbeard, but as a fine-dressed gentleman, receiving grateful acknowledgments through the newspapers, and publishing popular medical books, with the address of the author, and recommendations to apply to him. It has not unfrequently happened, however, that extraordinary men who were so far before their age as not to be understood by it, such as Paracelsus, have passed for charlatans until more justly esti-

mated by later times. Several books have been written on the charlatanism of scholars. J. B. Mencke's satire, *De Charlataneria Eruditorum* (Leip. 1715), is a classical work, which has been continued by Büschel in his book, *Ueber die Charlatanerie der Gelehrten seit Mencke.*

CHARLEMAGNE, i.e., Charles the great, king of the Franks (768–814 A.D.), and Roman emperor (800–814 A.D.), was b. on 2d April, 742, probably at Aix-la-Chapelle, and was the son of Pepin the short, the first Carlovingian (q.v.) king of the Franks, and grandson of Charles Martel (q.v.). On Pepin's death in 768, he and his brother Carloman jointly succeeded to the throne. By Carloman's death, and the exclusion of both his sons from the throne, C. became sole king. In 772, it was resolved in the diet at Worms to make war against the Saxons, for the security of the frontiers, which they continually threatened, and for the extension of the Christian religion. C. advanced as far as the Weser in 772, securing his conquests by castles and garrisons. Pope Adrian I. now called him to his aid against Desiderius, king of the Lombards. C. had married the daughter of Desiderius, and had sent her back to her father because she bore him no children, and married Hildegarde, daughter of the Swabian duke, Godfrey. Desiderius had sought revenge by urging the pope to crown the sons of Carloman, and on the pope's refusal, had laid waste the papal territory. C. crossed the Alps from Geneva, with two armies, by the great St. Bernard and mont Cenis, in 773, and overthrew the kingdom of the Lombards in 774. The Lombard dukes acknowledged him as their king, and he secured the pope's favor by confirming the gift which Pepin had made to the papal see, of the exarchate of Ravenna. In 775, he was again employed in the most northerly part of his dominions, reducing the Saxons to subjection; in 776, he suppressed an insurrection in Italy; in 777, he so completed his victory over the Saxons, that their nobles generally acknowledged him as their sovereign in an assembly at Paderborn. Being now invited to interpose in the wars of the Arabs and Moors in Spain, he hastened to that country in 778, and added to his dominions the regions between the Pyrenees and the Ebro. From Spain he was summoned in haste by a new insurrection of part of the Saxons, who had advanced almost to Cologne, but whom he drove back to the Elbe. In 781, he went to Italy, where the pope crowned his second son, Pepin, king of Italy, and his third son, Louis, an infant of three years old, king of Aquitaine. The Saxons once more rising in arms, defeated and destroyed a Frankish army on the Süntel in 782, which C., after a new victory, fearfully revenged by causing no fewer than 4,500 prisoners to be executed as rebels in one day. A more general rising of the Saxons followed, but in 783–85, the Frankish monarch succeeded in reducing them completely to subjection, and in persuading their principal chiefs to submit to baptism, and to become his faithful vassals. Subsequent insurrections and wars in Germany, between this year and 800, resulted in victories over the Bulgarians and Huns, and in the further consolidation and extension of his empire, the eastern boundary of which now reached to the Raab.

In 800, C. undertook an Italian campaign, which was attended with the most important consequences. Its immediate purpose was to support pope Leo III. against the rebellious Romans. When C., on Christmas day, 800, was worshiping in St. Peter's church, the pope unexpectedly, as it appeared, set a crown upon his head, and, amidst the acclamations of the people, saluted him as Carolus Augustus, emperor of the Romans. Although this added nothing directly to his power, yet it greatly confirmed and increased the respect entertained for him, such was still the luster of a title with which were associated recollections of all the greatness of the Roman empire. A scheme for the union of the newly revived western empire with the empire of the east, by C.'s marriage with Irene (q.v.), the Byzantine empress, failed by reason of Irene's overthrow. After this, C. still extended and confirmed his conquests both in Spain and in Germany. He labored to bring the Saxons to a general reception of Christianity, and founded bishoprics for this purpose. To the end of his reign, he was incessantly engaged in wars, and insurrections were always apt to break out in the frontier parts of his dominions; which he endeavored to secure, however, not only by military power and arrangements, but by improvements in political and social institutions. His views were liberal and enlightened to a degree rare for many subsequent ages. Whilst he made the power of the central government to be felt to the utmost extremities of his empire, he recognized in his subjects civil rights, and a limitation of monarchic power by their assemblies. He zealously endeavored to promote education, agriculture, arts, manufactures, and commerce. He projected great national works, one of which was a canal to connect the Rhine and the Danube; but he deemed nothing beneath his attention which concerned the interests of his empire or of his subjects. He required his subjects to plant certain kinds of fruit-trees, the cultivation of which was thus extended northward in Europe. His own domains were an example of superior cultivation. He had a school in his palace for the sons of his servants. He built sumptuous palaces, particularly at his favorite residences, Aix-la-Chapelle and Ingelheim—for he had no fixed capital—and many churches. Learned men were encouraged to come to his court. He himself possessed an amount of learning unusual in his age; he could speak Latin and read Greek. He attempted to draw up a grammar of his own language. C. was of more than ordinary stature, and of a noble and commanding appearance. He was fond

of manly exercises, particularly of hunting. He was too amorous, but in eating and drinking he was very moderate. His fame spread to all parts of the world: in 768, Harun-al-Raschid sent ambassadors to salute him. He enjoyed good health till shortly before his death, 28th Jan., 814. He was buried at Aix-la-Chapelle (q.v.), in a church which he had built there. He was succeeded by his son Louis, styled Louis le Débonnaire, the only one of his sons who survived him; but the greatness of his dynasty terminated with his own life. C. is styled Charles I. in the enumeration both of the French kings and of the German or Roman emperors. Besides his *capitularies* (q.v.), there are extant letters and Latin poems ascribed to him. His life was written by his secretary, Eginhard.

CHARLEMONT. See GIVET, *ante*.

CHARLEROI, a Belgian t. and fortress in the province of Hainaut, stands on the Sambre, between Mons and Namur, on the line of the Brussels and Namur railway. The pop. is (1873) 12,150, who carry on considerable manufactures in hardware, glass, woolen-yarn, etc. The district is rich in coal, and the number of smelting-furnaces and nail-factories in the neighborhood is very great. The ironworks of Couillet, which yield a third of all the cast-iron produced in Belgium, lie within a mile or two of the town. C. possesses considerable historical and political interest as a fortress. The fortifications were begun by the Spaniards in 1666, but falling into the hands of the French next year, they were completed by Vauban. After six exchanges of masters between the French and Spaniards, the peace of Aix-la-Chapelle, 1748, left C. in the possession of Austria. In 1794, after a protracted and desperate resistance, it was surrendered to the French by capitulation, when the fortifications were demolished. The importance of the place in a strategic point of view having become apparent during the campaign of 1815, the fortifications have been since restored.

CHARLES, a co. in s.w. Maryland, between the Potomac and Pawtucket rivers; 450 sq.m.; pop. '80, 18,548—10,852 colored. Surface uneven, with forests of locust, oak, ash, chestnut, and cedar. Tobacco is the main production. Co. seat, Port Tobacco.

CHARLES I., King of England, Scotland, and Ireland (1625–49), was b. at Dunfermline, 19th Nov., 1600, and was the second son of James I. of England (VI. of Scotland). On the death of his elder brother, Henry, in 1612, he became prince of Wales, and heir-apparent to his father s throne; to which he succeeded in 1625, but found both in England and Scotland a contest in progress between king and people. He had inherited from his father the most extreme notions of kingly prerogative, and he mistook the general movement in the public mind for an agitation amongst a few disaffected persons. He had deeply imbibed his father's notion, that an Episcopal church was the most consistent with the proper authority of kings; and he adopted severe and persecuting measures against the Puritans in England and the Presbyterians in Scotland. He married a Roman Catholic, Maria Henrietta of France, a marriage most displeasing to the nation; and even so far despised public opinion as to make his father's favorite, the duke of Buckingham, his prime minister and chief adviser. The English parliament, which he assembled in 1625, was resolved upon the vindication of the national liberties, and was therefore very sparing in its grants of subsidies, while that of 1626, instead of freely granting supplies, resolved upon the impeachment of Buckingham; whereupon the king threw into prison two of the boldest members, Elliot and Digges; dissolved parliament; and, to procure money, had recourse to the arbitrary measures of forced loans, and a tax upon the seaports (*ship-money*), imposed by the mere exercise of royal authority. By all this, public feeling was more and more embittered. In 1628, C. found it necessary again to summon a parliament; and the parliament, very resolute to maintain the liberties of the nation, presented the petition known in history as the *Petition of Right* (q.v). C. temporized, conceded, and finally, although the assassination of Buckingham had removed one cause of strife, assumed a threatening tone, and dissolved the parliament, 10th Mar., 1629. He even caused some of the leading members of the house of commons to be imprisoned. He now governed for 11 years without a parliament, having Laud (q.v.) and Strafford (q.v.) for his chief advisers, and obtaining for his edicts the semblance of a legal sanction by means of the star chamber (q.v.). All this while, the storm was gathering, the love of liberty increased, and republican principles were developed and extended. The policy which C. adopted was that of more severe repression. At length, in 1638, Scotland assumed an attitude of determined resistance to the imposition of a liturgy and of Episcopal church-government. The national covenant (q.v.) was subscribed, Presbyterianism was completely restored; and in 1639, the king having assembled an army for the purpose of reducing Scotland to subjection, the Scottish covenanters also took up arms, and advanced to the English border, many of the English regarding their approach with joy. Civil war was, however, prevented for the time, by concessions on the part of the king. Unable to do without supplies any longer, C. summoned an English parliament in 1640, which, instead of listening to his demands, began to draw up a statement of public grievances. C. soon dissolved the parliament, and assembled an army to resist the Scots, who had again taken up arms and entered England; but his army was defeated by them at Newburn-upon-Tyne, and they advanced southward, with the sympathy and good wishes of no small part of the king's English subjects. Much against his will, C. was now compelled again to call a parlia-

ment, whose memorable sittings began on 3d Nov., 1640. Both houses were resolute in their opposition to his despotism. They began by the impeachment of the ministers and high officers of state, and declared the decrees of the star chamber and court of high commission to be null and void. They passed a bill in favor of triennial parliaments; and the king, in trepidation, gave it his assent. He also consented, although against his own convictions, to the execution of Strafford; and even gave his assent to an act which provided that the present parliament should not be dissolved, prorogued, or adjourned, without its own consent. Hoping to win the favor of the Scots, he now visited Scotland; but whilst he was there, a rebellion broke out in Ireland, accompanied with a fearful massacre of Protestants. The prospect of a peaceful accommodation was now almost destroyed; the English parliament enlarged its demands; the king, after seeming to yield, took the extraordinary step of suddenly, on 4th Jan., 1642, appearing in the house of commons, accusing five members—Pym, Hampden, Hollis, Hazelrig, and Stroud—of high treason, and demanding that they should be delivered up to him. Both houses of parliament espoused their cause, and the city of London showed a determination to defend them by arms. C. left London with his family, and the parliament declared the kingdom in danger. Civil war began; the royalists had at first the advantage, but the national feeling was with the parliament. Negotiations were from time to time opened or renewed, but always in vain. After the battle of Naseby, on 15th June, 1645, in which his army was almost annihilated by the parliamentary troops under Fairfax and Cromwell, C. was compelled to seek refuge in the Scottish camp. Negotiations still proving fruitless, he was delivered up to the English parliamentary army. Negotiations were still attempted with C. in his captivity; but resulted in nothing. Finally, C. fled, was taken, refused the ultimatum of the army, and so enraged Cromwell and the Independents, that parliament was obliged to pass an act declaring all negotiation with the king to be treason. The Presbyterians of England and the Scots, who were always haunted by the idea that there was something sacred and inviolable in monarchy, thought to rescue the king from the hands of the Independents, but were defeated, and all the Presbyterians were forcibly expelled from the English house of commons, which now consisting only of about 60 members—the *Rump parliament*—appointed a court composed of persons from the army, the house of commons, and the city of London, to try the king. The court was opened with great solemnity in Westminster hall on 20th Jan., 1649. About 70 members took part in its proceedings. On the 27th of Jan., C. was condemned to death as a tyrant, murderer, and enemy of the nation. The Scots protested, the royal family entreated, and the court of France and states-general of the Netherlands interceded, but in vain. On 30th Jan., 1649, he was beheaded in front of the palace of Whitehall. In his last hours he showed great calmness and presence of mind. In his private character, C. was a man of cultivated mind, kind, and of irreproachable life; but in political affairs he was unscrupulous, and had recourse to dissimulation and falsehood for the accomplishment of his purposes. In the estimation of many who do not condemn it on moral grounds, his execution was a great political blunder. From the restoration of Charles II., the 30th of Jan. was observed in the church of England with special religious services, as the day of *king Charles the martyr*. This commemoration, offensive to great part of the community, and of the members of the established church itself, was abolished by act of parliament in 1859.

CHARLES II., King of England, Scotland, and Ireland (1649–85), the eldest son of Charles I., was b. 29th May, 1630, and went with his mother to France during the civil war. He was at the Hague at the time of his father's execution, and immediately assumed the title of king. He meditated an expedition to Ireland for the assertion of his claims, when the Scots offered him their crown in 1650, and proceeding to Scotland, he was crowned at Scone in the beginning of 1651. The limitations, however, under which he received the crown, were disagreeable to him, and he hated the restraint put upon his inclinations by the Presbyterian clergy. After the defeat of the Scots at Dunbar, he put himself at the head of their army, in hope of rousing the royalists of England to his support; but was completely defeated by Cromwell, at Worcester, on 3d Sept., 1651. He made his escape, amidst many dangers, to France, where his situation was by no means agreeable, and from which he went to Cologne, and afterwards to the Netherlands. After Cromwell's death, the desire of the English for a settled government leading to the restoration of the house of Stuart, he landed at Dover, on 26th May, 1660, was received with acclamation by the people, and ascended the throne almost untrammeled by a single condition. He was surrounded by men of extreme party-feeling, among whom the most influential was the chancellor, Clarendon (q.v.). The persons immediately concerned in the death of Charles I. were brought to the scaffold; Episcopacy was restored; and the Presbyterians and other non-conformists, both in England and Scotland, were subjected to great hardship and persecution. The king was extravagant, and soon found himself in want of money: he married the princess Catharine of Portugal, for the sake of her large dowry; he shamefully sold Dunkirk and Mardyke to the French; and for a pecuniary consideration, agreed to make war against the united provinces, although such a war was contrary to all the feelings of the English people and the interests of English commerce. The Dutch fleet, under De Ruyter,

entered the Thames, and C. was compelled to make an ignominious peace. After the fall of Clarendon, the ministry known as the Cabal (q.v.) ministry came into power—a ministry hateful to the country, composed of unprincipled men, and bent upon the restoration of popery and absolute monarchy. C. sought to conciliate the people by the *triple alliance*, in May, 1668, with Sweden and the states-general; but the French court soon found means to persuade him again to make war against the united provinces. He basely accepted pecuniary gifts and a pension from the French government; and, as even this, with all that he could get from his parliament, was insufficient for his expenses, he had recourse to illegal means of raising money. The story of the *popish plot* (q.v.) against the life of the king caused prodigious excitement amongst the people, and lord Stafford and many other persons were most unjustly brought to the scaffold. The parliament of 1679, very much against the will of the court, enacted the celebrated *habeas corpus act* (q.v.): and a bill was under consideration for the exclusion of the king's brother, the duke of York, from the throne, on account of his avowal of the Roman Catholic religion. The king, at this period of his reign, had, however, completely crushed the Presbyterians of Scotland, and was more absolute than any of his predecessors had been on either of the British thrones. Most arbitrary measures were adopted. The city of London was deprived of its privileges, because of the election of a sheriff disagreeable to the court. The *Rye-house plot* (q.v.), a widely-extended conspiracy, and in which the king's natural son, the duke of Monmouth (q.v.), was concerned, was discovered in 1683, and cost the lives of a number of persons, amongst whom were lord Russell and Algernon Sidney. C., however, appears to have recognized the necessity of a more liberal policy, when he was unexpectedly carried off by death, on 6th Feb., 1685. In his dying hours, he called in the assistance of a Roman Catholic priest, although he had not previously avowed his attachment to that religion. His reign was full of events dishonorable to his country, and of which he himself was generally the cause. His life was most dissolute; his adulteries, and the profligacy of his court, scarcely paralleled in British history. He had an affability, however, which won for him a certain sort of popularity.

CHARLES I., THE BALD, 823–77; King of France and emperor of the Romans, son of Louis le Debonnaire by his second wife, Judith. The father, in order to furnish C. a kingdom, took away portions of the territory of the other sons, and war among them followed, which ended in leaving C. in possession of a large kingdom in the w. part of the empire. When Louis died, C. undertook to succeed him as the emperor, and made an alliance with his brother Louis, the German. In 841, C. defeated his rival and eldest brother, Lothaire. In 843, the treaty of Verdun confirmed C. in possession of the kingdom, which comprised all France west of the Meuse, Saone, and Rhone, and Spain from the Ebro to the Pyrenees. But the government of C. was weak; the Norsemen pillaged the country almost without resistance; and finally the people, in despair of relief, called in the aid of his brother Louis, who drove C. from the country for a time. But C. had the church on his side, being entirely under control of the bishops, and in 875 he was crowned emperor by the pope. Louis was too strong for him, however, and he never to any great extent recovered his power. He died in 877, near mont Cenis, while on his way against the Saracens at the request of the pope.

CHARLES II., THE FAT, 832–88; King of the Franks and emperor of the Romans, third son of Louis the German. From his father, C. inherited Swabia; in 880, the death of his brother Carloman of Bavaria made him king of Italy; in 881, he was crowned emperor; the death of Louis of Saxony in 882, also a brother, brought him all Germany; and that of Carloman, the French king, in 885, left him all France; and so by no effort of his own, but by natural causes solely, C. became sovereign of all the dominions of Charlemagne. But he was a weak, gluttonous creature, more intent upon the pleasures of the table than upon matters of state. The Norsemen sailed up the Seine and laid siege to Paris, and C., instead of making even an attempt at resistance, bought them off with 700 pounds of silver and a free passage to the upper Seine and Burgundy, where they might ravage at will. In 887, C. was deposed by his people, and died the next year in a cloister.

CHARLES III., THE SIMPLE, 879–929; King of France; posthumous son of Louis the stammerer. By the death of his rival, Charles the fat, in 887, he obtained possession of the whole kingdom. The most conspicuous act of his reign was the cession to the harassing Norsemen of the territory afterwards known as Normandy, on condition that the heathen should be baptized, that Rollo (Hrolf Ganger, or Ralph the walker, a Danish pirate chief, and the ancestor of William the conqueror, of England) should marry Charles's sister, and become a duke and vassal of the crown. In 922, the barons rebelled against Charles, and elected Robert, brother of the previous king, in his place; but Robert was killed by Charles's own hand in the battle of Soissons, though that did not secure to him the victory. The barons then chose for king Raoul, duke of Burgundy. After many failures, misfortunes, and a long imprisonment, Charles died at Peronne.

CHARLES IV., THE FAIR, 1294–1328; King of France and Navarre; third son of Philip the fair, succeeded his brother Philip V., in 1322. The chief purposes of his policy were to free the country from the Lombards, and from the exactions of the barons

and the judges. He also did something towards improving the condition of the Jews, and assisted his sister Isabella in her contest with her husband, Edward II. of England. In 1325, being supported by the pope, Charles made an unsuccessful effort to attain the imperial crown.

CHARLES V., surnamed THE WISE, King of France (1364–80), was the son of king John, and was b. on 21st Jan., 1337. His father being made prisoner by the English at the battle of Poictiers, on 19th Sept., 1356, he assumed the regency. The most significant events which occurred under his rule, were the vigorous efforts of the *bourgeoisie* to deliver themselves from the tyranny of the nobles and the court, and the peasant war called the *Jacquerie* (q.v.). His father dying, 8th April, 1364, C. ascended the throne, and by his cautious policy rescued the kingdom from some of its troubles, and re-established the power of the crown, which had been much shaken. War with England raged for a number of years, but with results highly favorable to C., who stripped his enemies of all their conquests in France, except a few fortified places. He died 16th Sept., 1380. C. was fond of books and the company of learned men, but was not above the natural weakness of kings for outward pomp and magnificence.

CHARLES VI., King of France (1380–1422), b. at Paris, 3d Dec., 1368, was the son and successor of Charles V. He was only 13 years of age when his father died. For several years, his uncle, the duke of Anjou, acted as regent. In 1388, C. took the reins of government into his own hand, but during his life-time was so often afflicted with insanity, that party strife raged without much check. The two great families whose influence divided the nation, were those of Orleans and Burgundy. It was the Orleans party which called in the assistance of the English, and brought about the battle of Agincourt, so disastrous to the French nation. Subsequently the Burgundians allied themselves to the English, who laid waste the whole of northern France. In the midst of these calamities, C. died, 21st Oct., 1422.

CHARLES VII., King of France (1422–61), the son and successor of Charles VI., was b. on 22d Feb., 1403. On his father's death he was at the head of an army, with which he held possession of the southern provinces of the kingdom; Paris and the north being in the hands of the English, who proclaimed Henry VI. of England king of France, and appointed the duke of Bedford regent. For some time the events of war were unfavorable to C., who was compelled, in 1424, to evacuate Champagne, and, in 1425, Maine. In 1426, the count Dunois gained the first victory over the English at Montargis; but in the year following they besieged Orleans, a place of great importance to C., as securing a connection with the north, and he was roused to fresh energy. At this time, also, Joan of Arc (q.v.), the maid of Orleans, by her wonderful courage and confidence of a heavenly mission, roused the fervor both of nobles and people. The siege of Orleans was raised in May, 1429; the English retired disheartened, and gradually lost their acquisitions in France. A treaty between the French king and the duke of Burgundy greatly advanced the French cause. In 1436, C. entered Paris; and during the further progress of the war, the English lost all their strongholds except Calais. In 1452, they were finally defeated at Castillon. After he was established on his throne, C. devoted himself to the reorganization of the government, in which everything had fallen into confusion, but showed a strong anxiety to frame it according to a scheme of perfect despotism, and for this purpose to provide himself with a powerful and well-disciplined standing army, which caused some discontentment among the nobles of his kingdom. His government, however, was mild, and under it France recovered in some measure from the effects of the terrible calamities which it had endured. His last years were embittered by the conduct of his son, the dauphin, afterwards Louis XI.; and his apprehension that his son would poison him was so strong, that his consequent abstinence from food is supposed to have hastened his death, which took place at Melun on 22d July, 1461.

CHARLES VIII., King of France (1483–98), was b. at Amboise on 30th June, 1470, and succeeded to the throne on the death of his father, Louis XI. For some time the government was carried on under the regency of his sister, Anne of Beaujeu. When C. attained his 21st year, he took the royal power into his own hand, and soon developed a bold and ambitious spirit. The most important incident of his career was his conquest of Naples in 1495, to the throne of which he believed he had a claim. The Italian princes and other European potentates were alarmed by his success. A league was hastily formed between the pope, the emperor of Germany, Ferdinand of Spain, the republic of Venice, and Sforza, duke of Milan, to oppose his return to France. C., however, gallantly broke through the allied forces near Piacenza, and effected a retreat to his own country. It was with difficulty he was hindered by his councilors from resuming his warlike designs on Italy. C. is also said to have meditated the expulsion of the Turks from Europe, and making himself emperor of Constantinople; having received from Andreas Palæologus, the grandson of the last Grecian emperor, a transference of his claims to the Byzantine throne. He died 7th April, 1498.

CHARLES IX., King of France (1560–74), the second son of Henry II. and of Catharine de' Medici (q.v.), was b. at St. Germain-en-Laye on 27th June, 1550, and on 5th Dec., 1560, succeeded to the throne on the death of his brother, Francis II. His char-

acter was a compound of passion, acuteness, heartlessness, and cunning. Although only 24 years of age when he died, so well had his detestable mother trained him to a love of perfidy and cruelty, that he found time, with her assistance and that of the Guises, to perpetrate an act so hideously diabolical, that all civilized Europe still shudders at the recollection. The massacre of St. Bartholomew's (q.v.), 24th Aug., 1572, was the culmination of a series of treacheries towards the Huguenots, which disgraced his reign. The result was, that civil war broke out anew, and assumed a very threatening character, as political malcontents associated themselves with the Protestants. C. died May 30, 1574.

CHARLES X., King of France (1824–30), third son of the dauphin Louis, and grandson of Louis XV., was b. at Versailles, 9th Oct., 1757. He received the title of count d'Artois, and in 1773 married Maria Theresa of Savoy. After the events of 14th July, 1789, he and the prince of Condé took the lead of the emigration. In 1796, he sailed from England with a squadron under commodore Warren, on an expedition to the western coasts of France, whereupon twenty departments rose in insurrection; but he had not courage to land and place himself at the head of the insurgents, whom he basely left to the vengeance of the republicans. Detested now by the royalists of France, and despised by the British, he lived in obscurity until the allies entered Paris in 1814, when he appeared in France as lieutenant-general of the kingdom, and issued a proclamation announcing the end of despotism, of conscriptions, and of oppressive taxes. After the second restoration, he took little open part in politics, but lived surrounded with priests, Jesuits, and nobles of the old school; and in this circle originated the tyrannical and unconstitutional measures to which even Louis XVIII. made considerable opposition, but which at this time disgraced the government of France. The death of Louis, on 16th Sept., 1824, brought C. to the throne. He took the oath of adherence to the charter, but soon displayed his intention of restoring as much as possible the absolutism of the old French monarchy. Popular discontent rapidly increased. A royal speech, of a threatening character, on 2d Mar., 1830, was followed by an address of remonstrance, signed by 221 deputies, upon which the king dissolved the chambers. The deputies who signed the address were all re-elected, but the court taking fresh courage from the success of the expedition to Algiers, the celebrated ordinances of 25th July were signed by the king, putting an end to the freedom of the press, already largely curtailed, appointing a new mode of election, and dissolving the recently elected chamber. The capital took up arms, the guards refused to act, and the king soon found himself compelled to flee. As a last resource, he abdicated the throne, on 2d Aug., 1830, in favor of his grandson, Henry, duke of Bordeaux, the dauphin also consenting to this act. But it was too late; the revolution was accomplished, and Louis Philippe, duke of Orleans, was chosen king of the French. C. made his escape to England, resided for some time at Holyrood, and afterwards at Prague. He took no part in the political intrigues and attempts of the duchess de Berri. He died of cholera at Görz, on 6th Nov., 1836. His only surviving descendant, in the male line, is his grandson, the count of Chambord (q.v.).

CHARLES IV., German emperor (1346–78), was b. at Prague in 1316, and was the son of king John of Bohemia, of the house of Luxembourg, who fell in the battle of Crecy. At the instigation of pope Clement VI., to whom he had previously taken an oath of humiliating submission at Avignon, he was elected emperor by a portion of the electors on 11th July, 1346, although Louis IV. then actually filled the imperial throne. But even after the death of Louis, it was not without difficulty that he obtained secure possession of it. He was crowned king of Italy at Milan in 1354, and emperor at Rome in 1355. In 1356, he issued the golden bull (q.v.), the fundamental law concerning the election of German emperors; in defiance of the very letter of which he afterwards, by large bribes, secured for his own son, Wenceslaus, the succession to the empire. He died at Prague, 29th Nov., 1378. C. was an artful politician, but destitute of true greatness. He sought the support of the clergy by undue concessions, sold rights and privileges in Italy and other parts of the empire for money, and cared chiefly for the prosperity of his hereditary kingdom of Bohemia.

CHARLES V., German emperor, was b. at Ghent on 24th Feb., 1500. He was the eldest son of Philip, archduke of Austria, and of Joanna, the daughter of Ferdinand and Isabella of Spain. Philip's parents were the emperor Maximilian and Maria, daughter and heiress of Charles the bold, duke of Burgundy. On the death of his grandfather, Ferdinand, in 1516, C. took possession of the throne of Spain by the title of Charles I., his mother Joanna being of disordered intellect and incapable of reigning He was not, however, very favorably received by the Spanish nobles, who were doubtful of his right, and jealous of the followers whom he brought from the Low Countries, where he had been educated. All the abilities of his famous minister Ximenes (q.v.) were requisite to prevent an open revolt. On the death of Maximilian in 1519, C. was elected German emperor from amongst a number of competitors, chiefly through the influence of the elector Frederic of Saxony. In his earlier years he had been frivolous and dissolute, but he now became mindful of the duties and dignity of his high position. On 22d Oct., 1520, he was crowned at Aix-la-Chapelle, and received from the pope the title of Roman emperor. He ascended the imperial throne at a

time when Germany was in a state of unprecedented agitation concerning the doctrines proclaimed by Luther. To restore tranquillity, a great diet was held at Worms in 1521, Luther's declaration of his principles before which forms a well-known and important passage in the history of the reformation. In 1522, he reduced to subjection the towns of Castile, which had leagued themselves together for the maintenance of their ancient liberties. He was likewise successful in his war against the Turks under Solyman the great. C. was involved also in a struggle of long duration with France, in which, after many alternations of fortune, his armies at last drove the French from the greater part of their conquests in Italy; and Francis I. of France fell into his hands as a prisoner, after a battle by which the siege of Pavia was raised on 24th Feb., 1525.

The pope, however, began to grow alarmed at his victories, and therefore allied himself with France and the principal Italian states, and released the king of France from the obligations under which he had come by his treaty with Charles. It was the pope's object to exclude C. from all dominion in Italy; but the emperor's forces under Charles of Bourbon, the former constable of France, took Rome itself by storm, plundered it, and made the pope prisoner. C. pretended great regret for this, went into mourning with all his court, and caused prayers to be said for the pope's liberation, whilst by his own directions the pope was kept for seven months a captive. Peace was concluded in 1529, on terms most favorable for the emperor. He now thought to put an end to the religious differences in Germany, and to repel the Turks, who had overrun Hungary and laid siege to Vienna. But the diet at Augsburg in 1530, proved how vain was the hope of restoring the former state of things in Germany; and the emperor refusing to recognize the confession of the Protestants, they refused to help him against the Turks. In 1531, the Protestant princes formed the league of Smalcald (q.v.), and allied themselves with France and England for their own protection. This, and the continued assaults of the Turks, compelled the emperor to yield in some measure to the demands of the Protestants. In 1535, C. undertook an expedition from Spain against the pirate Barbarossa, who had established himself in Tunis, and whose vessels did prodigious injury to the commerce of Spain and Italy. In this expedition he was completely successful, and set free no fewer than 22,000 Christians, who had been held as slaves. War again broke out with France; an armistice for ten years was concluded in 1538; and C. even visited Paris, where he was magnificently entertained. But the war broke out afresh in 1542, and terminated in favor of the emperor; who also triumphed in the battle of Mühlberg, 25th April, 1547, over the Protestant princes of Germany, and deprived the elector John Frederic of Saxony of his territories. But he showed so plainly his intention of converting the German empire into a hereditary possession of his family, that new opposition arose, and C. was compelled to flee before the arms of duke Maurice of Saxony and the Protestants, and in 1552 to promise them the peaceful exercise of their religion, which was confirmed by the diet at Augsburg in 1555. Henry II. of France also took from C. some parts of Lorraine. His health failing, C. now declared, in an assembly of the states of Louvaine, his resolution to seek repose, and devote the remainder of his days to God. He resigned the government of his dominions to his son, for whom, however, he vainly sought to secure the imperial throne; and having relinquished to him the crown of Spain on 15th Jan., 1556, he retired to the monastery of Yuste, in Estremadura, where he spent two years partly in mechanical amusements, partly in religious exercises, which are said to have assumed a character of the most gloomy asceticism, and died on 21st Sept., 1558. By his wife Isabella, daughter of king Emmanuel of Portugal, he had one son, his successor, Philip II. of Spain, and two daughters. His brother Ferdinand succeeded him in the empire.

CHARLES VI., German emperor, 1711–40, the last of the proper male line of the house of Hapsburg, was the second son of the emperor Leopold I., and b. 1685. His father intended for him the crown of Spain; but Charles II. of Spain, yielding to French intrigues, assigned it by testament to Philip of Anjou, whereupon arose the great war of the Spanish succession—Britain and Holland taking part with the emperor against France, for the maintenance of the balance of power in Europe. C. was acknowledged by the allies as Charles III. of Spain, but had not succeeded in obtaining permanent possession of the kingdom, when the death of his brother, the emperor Joseph I., recalled him to Germany in 1711; and as he now became emperor of Germany, Britain and Holland concluded the peace of Utrecht with France in 1713. C. continued the war for some time longer; but was at last obliged to give up his claim to Spain, being confirmed, however, in possession of the Spanish Netherlands and of the Spanish possessions in Italy. Success attended his arms in a war against the Turks, and in a war with Spain, which arose out of the project, of the Spanish minister Alberoni, and in which the *quadruple alliance* was formed—France, Britain, and Holland joining the emperor against Spain. But C., having lost his only son, and being very anxious to secure the throne to his own descendants, named his daughter, Maria Theresa (q.v.), as his heiress, by a *pragmatic sanction* (q.v.), to which he had much difficulty in obtaining the consent of some of the German states and some foreign powers; and to accomplish this object he gave up Tuscany, Parma, and Piacenza, and afterwards Naples, Sicily, Lorraine, and some parts of Milan. Meanwhile, he was unsuccessful in wars

with France and Spain, and with the Turks, who compelled him, in 1739, to resign his former conquests. He died 20th Oct., 1740. He was of a mild and benevolent disposition, but full of superstition and of prejudices in favor of feudalism and ecclesiastical domination.

CHARLES VII., German emperor (1742–45), was b. at Brussels in 1697, and was the son of Maximilian Emmanuel, elector of Bavaria, and for some time governor of the Spanish Netherlands. After the conquest of the Bavarian territories, and the pronunciation of the ban of the empire against his father by the emperor Joseph I., he was for some time the emperor's prisoner; but after the decease of Joseph, he married his youngest daughter; and having, in 1726, succeeded his father as elector of Bavaria, refused his consent to the pragmatic sanction (see preceding article); and on the death of Charles VI. in 1740, advanced a claim to the Austrian dominions in right of his wife, and upon the further ground of a testament of Ferdinand I. Success at first attended his arms; he was acknowledged as archduke of Austria, and then as king of Bohemia, upon which he was also, in 1742, elected emperor. But the tide of fortune now turned against him. The Hungarians rose in favor of Maria Theresa, and he was driven from Austria and from Bohemia, and for a time even from his Bavarian capital, Munich. Disease and calamities combined to cause his death, 20th Jan., 1745, shortly before which he said, "Misfortune will never leave me till I leave it."

CHARLES, Count of Anjou and Provence, King of Naples and Sicily, about 1220–85. He was the ninth son of Louis VIII. of France, and wedded Beatrice, heiress of Provence, after scattering his rivals by the aid of an army furnished by his brother, Louis IX. His next adventure was on a crusade to the Holy Land in company with his brother, when both were taken prisoners. Returning to Provence, Charles resumed his authority, and began to cherish high ambitions. He first assisted Margaret of Flanders, in a plan to set aside the children of her husband by a former wife, for the aggrandizement of her own offspring, for which Charles was to receive the province of Hainault; but Louis interfered and Charles was compelled to relinquish Hainault for a sum of money. About this time the pope, Urban IV., requested Charles to assume the crown of the Two Sicilies, to assist in the overthrow of the bastard Manfred, the Ghibelline king; and in 1265, Charles was crowned at Rome; a crusade was preached against Manfred, who was taken and killed; Conradin, the legitimate heir, was also betrayed, captured, and murdered; a like fate was dealt out to many Italian nobles; estates were confiscated to reward the French mercenaries; and they established over Sicily an arbitrary and brutal rule. Charles aimed at becoming the head of the eastern empire. With this intent he accompanied his brother on another crusade; but the venture failed in consequence of a great storm and the breaking out of the plague. Charles also incurred the enmity of the pope, Nicholas II., by refusing to accept the hand of his niece for Charles's grandson; so Nicholas went over to the Ghibellines, and took from Charles his titles. But Nicholas died in 1280, and Charles procured the election of a Frenchman, Martin IV., to the chair of St. Peter, in return for which Charles was made senator of Rome, and his rival, the emperor Michael Palæologus, was excommunicated. Another expedition was ready for the east, when news was brought of the rebellion, afterwards known as the Sicilian Vespers (see *ante*); the people of Sicily had risen against their conquerors, and on Easter Monday, 1282, nearly exterminated the French in all Sicily. Charles at once sent his fleet against Messina, refusing all offers of capitulation; but the city held out until assistance came from Don Pedro of Aragon, and Charles's fleet was burned. Despairing of other means of success, Charles challenged Don Pedro to single combat; the latter accepted, but only Charles appeared in the list. Soon afterwards Charles's son was defeated and taken prisoner; and in 1285, Charles himself fell ill and died at Poggia.

CHARLES III., OF DURAZZO, 1345–87; King of Naples and Hungary. His father, who had rebelled against the queen, Joanna I. of Naples, died in prison; and the queen adopted the son, but afterwards displaced him in favor of Louis of Anjou, the father of Charles V. of France. Charles made an alliance with the king of Hungary, and set out to invade Naples. At Rome he was crowned king by the pope; thence he went to Naples, captured the queen, and had her assassinated. Three years later he was invited to accept the crown of Hungary by the nobles, who were dissatisfied with the rule of queen Elizabeth, and was crowned on the last day of the year 1386. Five weeks afterwards Elizabeth caused him to be murdered in her own presence. As he and his kingdom of Naples were under papal interdict, his body remained unburied for five years.

CHARLES I., b. 1839; Prince of Roumania, second son of prince Charles Anthony of Hohenzollern. In 1866, Charles was elected president of Roumania by an almost unanimous vote. He found the country in a wretched condition, the treasury empty, education unprovided for, and the people divided into warring political factions. By energy and good statesmanship he greatly improved matters, and when the Russo-Turkish war began he seized the occasion to proclaim Roumania's entire independence of Turkey, and such a declaration was officially made by the chambers. In 1869, Charles married princess Elizabeth of Wied. He d. 1877, leaving no children.

CHARLES II., 1661–1700; King of Spain; son of Philip IV. He was but four years old when his father died, the regency being in the hands of the queen, Anna Maria of Austria. During her rule, Spain was much weakened by an unsuccessful war with France and by the loss of Sicily. In 1675, Charles assumed the government, taking for his chief adviser Don John, an illegitimate son of the late king. By marrying Louise of Orleans, a niece of Louis XIV., Charles maintained harmony with France for several years. After her death, Charles married a sister of the emperor, Leopold I., and in 1694 he joined Leopold in a war against France. The war was speedily concluded by the peace of Ryswick, 1697, and as Charles was childless there was a long negotiation concerning the succession, ended through the influence of the pope, who secured the crown for the grandson of Louis XIV., Philip Bourbon, who ruled Spain as Philip V.

CHARLES III., 1716–88; King of Spain, second son of Philip V., and great-grandson of Louis XIV. of France. Parma, Piacenza, and Tuscany having fallen to Spain, Charles, at the age of 15, was furnished with an army and given rule over those countries. At 18 he conquered the Two Sicilies, and the emperor was obliged to acknowledge him as king. On the death of his brother, Charles succeeded to the Spanish throne, in 1759. He was a man of ability and liberal ideas, and made many reforms, especially in financial administration. The Jesuits were banished, and an unsuccessful effort was made to bring the inquisition under the control of the civil power. He endeavored to put a stop to brigandage and to Algerine piracy; and interested himself in the development of commerce, and arts and sciences. In 1763, he ceded Florida to England in exchange for Cuba, and some years later he joined France in sending assistance to the American colonies, then engaged in the war for independence. At the close of the war, Florida was again given to Spain. He made an unsuccessful attempt to rescue Gibraltar from the English. Charles died in Madrid after a reign of 29 years.

CHARLES IV., 1748–1819; King of Spain, son and successor of Charles III. When very young, Charles married his cousin, Maria Louise of Parma, who soon acquired great influence over him. The government was conducted chiefly by Manuel Godoy, a handsome guardsman who gained the friendship of both the queen and her husband, and was made duke of Alcudia, and minister of foreign affairs. Godoy concluded peace with the French republic in 1795, after an unsuccessful attempt on the part of the king to assist his relative, Louis XVI. Soon after this peace an offensive and defensive alliance was made with France, and Spain speedily became involved in war with Portugal and also with England, the main event of which was the destruction of the Spanish fleet by Nelson at Trafalgar in 1805. In 1807, Charles made with Napoleon a secret treaty according to which Portugal was to be seized by the French and Spanish, and the greater part to be divided between Godoy and the queen of Etruria, and Charles was to assume the title of emperor of Amercia; at the same time, 16,000 Spanish troops were to be sent to the assistance of the French in Denmark. While this was going on, Napoleon was intriguing with Don Ferdinand, the heir to the throne, who was soon after discovered in a plot to assassinate his father. Though pardoned, Ferdinand continued to do all that he could to arouse ill feeling against the court, and in 1808, Charles was so alarmed at disturbances in Madrid, that he abdicated in Ferdinand's favor. Charles declared immediately that this act was not voluntary; but the matter was decided by a meeting with Napoleon at Bayonne, urged by Godoy, who was moved by fear of Ferdinand, and also by the queen. Charles surrendered the crown to Napoleon (who gave him a pension of six millions of francs, and the castle and grounds of Chambord), refusing again to assume authority, although he might have done so, his son being very unpopular.

CHARLES IX., 1550–1611; King of Sweden, the fourth son of Gustavus Vasa. The Swedish crown belonged to Charles's nephew, Sigismund, king of Poland; but as he was a Roman Catholic, Charles was appointed to direct the government till Sigismund signed a decree establishing the Lutheran religion in Sweden. After many attempts at accommodation, Sigismund was formally deposed in 1604, and Charles was elected king. He had wars with Poland, Russia, and Denmark, and when 60 years old he challenged the king of Denmark to single combat, but the Dane did not respond. Charles founded the university of Gothenburg, and made a new code of laws. He wrote a rhymed chronicle of the war with Poland.

CHARLES X., or CHARLES-GUSTAVUS, king of Sweden, was b. at Nyköping, 8th Nov., 1622. After studying at the university of Upsala, he traveled through France, Germany, and Switzerland, joined the army of Torstensohn (q.v.) in 1642, fought at the battles of Yankovitz and Leipzig; and at the close of the war was the representative of queen Christina at the conferences which were held for giving effect to the treaty of Westphalia. On the abdication of Christina, Charles-Gustavus, who was the son of Gustavus Adolphus' eldest sister Catharine and John Casimir, the palatine of Zweybruck in Clerburg, succeeded as next heir, 17th June, 1654, to the throne of a kingdom which, after his accession, he discovered to be in an almost bankrupt condition. There was a debt of 10,000,000, while the revenue did not amount to 800,000 crowns, out of which one fourth was granted as a pension to the ex-queen, whose carelessness and extravagance had brought about this deplorable state of matters, and who, in the words of the aged chancellor Oxenstierna, "had cost Sweden dearer than ever an enemy did."

She had taken away everything belonging to the royal residences which was portable; and C. was forced at first to borrow even a set of kitchen utensils. C. was the second of the three great warrior-monarchs of Sweden, but unlike his uncle, who could plead religious grounds, and his grandson, who was at first forced to fight for self-preservation, C. seemed to make war principally for war's sake. First, he attacked Poland in July, 1655, because the Polish monarchs had not resigned their claim to the Swedish throne; captured in the same year Warsaw, Cracow, Thorn, Elbing, Posen, and Kaliez; and drove the king to take shelter in Silesia; he then assailed the Danes, who had declared war against him, crossed the belts on the ice, and speedily made himself master of all the continental possessions of Denmark. Next marching from isle to isle over the frozen sea, he ultimately, by menacing Copenhagen, compelled the treaty of Roskild (7th Mar., 1658), which gave to Sweden, Holland, Scania, Bleckingen, Bornholm, and the other Danish possessions beyond the sound, and emancipated Sweden from the sound dues. Charles, however, still cherished enmity against the Danes; and after fruitlessly proposing to the Dutch and English, a partition of Denmark, he invaded Zeeland, and attacked Copenhagen in 1659. The capital, however, defended itself valiantly, aided by succor from the Prussians and Dutch; and the Swedish monarch was compelled to abandon the siege. Soon after, while laboring to effect a complete reconciliation with Poland in order to be free to attack the Danes in Norway, he died suddenly at Gothenburg, Feb. 23, 1660.

CHARLES XI., one of the ablest kings of Sweden, was the son of king Charles (X.) Gustavus, and was b. Nov. 24, 1655. While he was little more than four years old at his father's death, the government was committed to his mother Hedwig as regent, and a council. The peace of Oliva (May 3, 1660) with Poland, by which Sweden obtained Esthonia, part of Livonia, and Oesel, and the Polish monarch renounced all pretensions to the Swedish crown; and that of Copenhagen (June 6, 1660), generally confirmatory of the treaty of Roskild with Denmark, were the first important acts of the government. A treaty with Russia on the basis of the *status quo* followed in 1661; and from this period till 1672, the kingdom was free from foreign wars. In Dec., 1672, C. (whose education had been so ill attended to that he had reached manhood before he could read) took the reins of government, and by the allurements of France, was induced to make war on Brandenburg. This unprovoked attack was disastrous to the Swedes, for they suffered a severe defeat from the elector at Fehrbellin (1675); and though C. revenged himself by defeating the Danes (who were allied with Prussia) at Halmstadt, Lemd, and Landskrona, his fleet was defeated by the Dutch near Oeland, and again by the Danes at Bleking and Kiöge; and many of Sweden's recent acquisitions were wrested from her. These, however, were restored by the peace of Saint-Germain-en-Laye (17th Sept., 1679), which closed this needless and unfortunate contest. In 1680, a struggle commenced between the crown, supported by the burghers and peasants, on one hand, and the nobles on the other; and a considerable diminution of the power of the nobles was the consequence. The resumption of all the crown lands which had been alienated since 1609, was a fatal blow to the preponderating power of the nobles; and by a voluntary declaration of the states, Dec. 9, 1682, the king was invested with absolute authority. This voluntary erection of a despotism by the people, a thing of rare occurrence in the world's history, is yet more extraordinary at the close of the 17th c.; and it speaks highly for C. that he never employed his unlimited authority otherwise than for the best interests of his kingdom. By a judicious administration of the revenues, he was enabled to extinguish the public debt (1686), reorganize the fleet and army, and by 1693 to dispense with the calling up of extraordinary subsidies. Though absolute, he never imposed a tax but with consent of the states; and he every year published a detailed account of revenue and expenditure. In 1693, he was formally declared absolute by an act of the diet. The foreign policy of the country was also conducted in a manner equally satisfactory and effective. Deux-Ponts fell to him as heir to his cousin Friedrich-Ludwig, the last palatine, in 1681; the attempts of the Danes upon Holstein were rigorously repressed, and many small outlying territories were brought under his sway. His anxiety for his subjects' welfare was particularly shown by commercial and maritime regulations superior to any that then existed in Europe; and by his numerous journeys to all parts of his dominions to examine for himself into the remote details of the administration. A codification of the laws was commenced but was unfinished at his death, which took place at Stockholm, 15th April, 1697.

CHARLES XII., King of Sweden (1697–1718), was the son of Charles XI., and was b. at Stockholm on the 27th June, 1682. On the death of his father in 1697, he ascended the throne, and notwithstanding his youth, the states declared him of age to assume the reins of government. The neighboring powers thought this a favorable time to humble Sweden, then the great power of the n.; and Frederick IV. of Denmark, Augustus II. of Poland, and the czar Peter I. concluded a league for this object. The Danes began by invading the territory of the duke of Holstein Gottorp, who had married C.'s eldest sister, and who applied to him for assistance. The young king immediately resolved on the most active measures, and approached Copenhagen with such a force as presently compelled the Danes to make peace. C. now hastened to meet the Russians; and although they lay in an intrenched camp beneath the walls of Narva, 50,000 strong, he

stormed their camp on 30th Nov., 1700, with 8,000 Swedes, and defeated them with great slaughter. He next dethroned Augustus II., and procured the election of Stanislaus Leszczynski as king of Poland. Augustus supposed himself safe at least in Saxony, his hereditary dominion, but was followed thither, and humbling terms of peace were dictated at Altranstädt in 1706. C. obtained from the emperor liberty of conscience for the Protestants of Silesia. Leaving Saxony with an army of 43,000 men in Sept., 1707, he proposed to advance direct upon Moscow; but at Smolensk he was induced, by the representations of the Cossack *hetman*, Mazeppa, to change his plan and proceed to the Ukraine, in hope of being joined by the Cossacks. In this hope, however, he was disappointed, and after enduring many hardships, he was defeated by the Russians at Pultowa, on the 27th June, 1709, and fled to Bender in the Turkish dominions.

Augustus II. now revoked the treaty of Altranstädt, and the czar and the king of Denmark assailed the Swedish territories. But the regency in Stockholm adopted measures of effective and successful resistance, and C. prevailed with the porte to declare war against Russia, in which Peter seemed at first likely to have suffered a severe defeat. But Russian agents succeeded in inspiring the Turks with suspicions concerning the ultimate designs of C., who was conveyed to Adrianople, but after some time escaped, and made his way through Hungary and Germany, pressing on by day and night with extraordinary speed till he reached Stralsund, where he was received with great joy, on 11th (22d) Nov., 1714. He was soon, however, deprived of Stralsund by the allied Danes, Saxons, Prussians, and Russians. After he had adopted measures for the security of the Swedish coasts, his passion for war led him to attack Norway. Success appeared again to attend his arms, when, in the siege of Friedrichshald, on 30th Nov., 1718, he was killed by a musket-bullet. On his death, Sweden—exhausted by his wars—ceased to be numbered among the great powers. He was a man capable of comprehensive designs, and of great energy in prosecuting them. His abilities apppeared not merely in military affairs, but in his schemes for the promotion of trade and manufactures. His self-willed obstinacy, however, amounted almost to insanity; in fact, he has been termed "a brilliant madman." His habits were exceedingly simple: in eating and drinking, he was abstemious; and in the camp, he sought no luxuries beyond the fare of the common soldier.

CHARLES XIII., King of Sweden (1809–1818), b. Oct. 7, 1748, was the second son of king Adolphus Frederick, and of the sister of Frederick the great of Prussia. He was trained for naval command, and was long the high admiral of Sweden, in which capacity he distinguished himself by a great victory over the Russians in the gulf of Finland in 1788, and by bringing back his fleet safe to Carlscrona in the most perilous season of the year. He was on several very important occasions called to an active part in political affairs—in the revolution of 1772, when he was made governor-general of Stockholm and duke of Södermanland; after the assassination of his brother Gustavus III. in 1792, when he was placed at the head of the regency; and after the revolution of 1809, when he became administrator of the kingdom, and subsequently king. The Swedish monarchy now became limited instead of despotic. Having no child, C. concurred with the states of the kingdom in choosing as his successor the French general, Bernadotte, who became crown-prince of Sweden, and ascended the throne on the death of C., Feb. 5, 1818. The prudence of the king and crown-prince secured the union of Norway with Sweden in 1814, as a compensation for Finland.

CHARLES XIV., King of Sweden and Norway (1818–1844), originally Jean Baptiste Jules Bernadotte, was b. at Pau, in the s. of France, Jan. 26, 1764. He was the son of a lawyer. He entered the French army as a common soldier; became an ardent partisan of the revolution; greatly distinguished himself in the wars of Napoleon, and soon attained the highest military rank. But he was distrusted by Bonaparte, whose ambitious schemes he took no part in promoting; and Napoleon having taken offense at his conduct after the battle of Wagram, Bernadotte left the army in disgust, and returned to Paris. He was afterwards sent by the ministerial council to oppose the British, who had landed at Walcheren, but the breach between the emperor and him grew wider. In 1810, he was elected crown-prince, and heir to the throne of Sweden. Almost the only condition imposed on him was that of joining the Protestant church. He changed his name to Charles John; and the health of the Swedish king, Charles XIII., failing in the following year, the reins of government came almost entirely into his hands. He refused to comply with the demands of Napoleon, which were opposed to the interests of Sweden, particularly as to trade with Britain, and was soon involved in war with him. He commanded the army of the allies in the n. of Germany, and defeated Oudinot at Grossbeeren, and Ney at Dennewitz. He showed great reluctance, however, to join in the invasion of France, and was tardy in his progress southward.—He became king of Sweden on the death of Charles XIII., Feb. 5, 1818. He won for himself the character of a wise and good king. Education, agriculture, manufactures, commerce, and great public works, as well as the military strength of the kingdom, were promoted by his care. He died Mar. 8, 1844, and was succeeded by his son Oscar.

CHARLES XV., 1826–72; King of Sweden and Norway, succeeding his father, Oscar I., who was a son of Charles XIV. The rule of C. was liberal and popular. The most important event was the change (in 1866) in the constitution of the parliament,

which from that time has consisted not of four, but of two chambers, one elected by the provincial representatives and the other by the people. Charles's kindly nature was shown in his firm refusal to sanction capital punishment. He had a taste for literature and art, and published a volume of poems. In 1850, he married Louisa, daughter of the king of the Netherlands, by whom he had one daughter, who became the wife of prince Frederick of Denmark.

CHARLES, Archduke of Austria, third son of the emperor Leopold II., was b. at Florence, 5th Sept., 1771. Whilst yet a youth, he pursued military studies with much ardor; and after having greatly distinguished himself as a gen. in inferior commands, he was intrusted, in 1796, with the chief command of the Austrian army on the Rhine. He fought with great success against Moreau at Rastadt, defeated Jourdan in several battles, drove the French over the Rhine, and concluded his victories by taking Kehl in the winter. In 1799, he was again at the head of the army on the Rhine, was several times victorious over Jourdan, protected Suabia, and successfully opposed Massena. In 1800, bad health compelled him to retire from active service; but being appointed gov. gen. of Bohemia, he formed a new army there. After the battle of Hohenlinden, he was again called to the chief command, and succeeded in staying the rapid progress of Moreau, but almost immediately entered into an armistice with him, which was followed by the peace of Luneville. In 1805, he commanded the army opposed to Massena in Italy, and fought the hard battle of Caldiero; but upon bad tidings from Germany, retreated from the left bank of the Adige to Croatia. This retreat was one of his greatest military achievements. In 1809, he won the great battle of Aspern, which first showed to Europe that Napoleon was not invincible; but he did not promptly enough follow up his victory, and Napoleon, who hastened to reinforce his army, retrieved his fortunes at Wagram, and the archduke was now compelled to give way before the enemy, till he reached Znaim, where an armistice was concluded on 12th July. In the campaigns of 1813 and 1814 he had no part; and lived in retirement till his death, 30th April, 1847.

CHARLES, Elizabeth Rundle, b. about 1826; the wife of Andrew P. Charles, of London. She has written *Chronicles of the Schonberg-Cotta Family; Diary of Mrs. Kitty Trevylyan;* and other popular works of fiction.

CHARLES, Jacques Alexandre César, 1746–1823; a French physicist, noted for skill in experiments and public demonstrations. He made the first balloon to hold hydrogen gas, with which a successful ascent was made. He was the inventor of a number of optical instruments.

CHARLES ALBERT, King of Sardinia (1831–49), b. 2d Oct., 1798, was the son of the prince Charles Emmanuel of Savoy-Carignan, and in 1800, succeeded to his father's title and estates in France and Piedmont. In 1817, he married Maria Theresa, daughter of the archduke Ferdinand of Tuscany. When the revolutionary movement took place in Piedmont in 1821, he was made regent, upon the abdication of Victor Emmanuel, until Charles Felix, the brother of the late king, should arrive to assume the sovereignty. He displeased both the liberal party and their opponents, and Charles Felix disallowed all his acts, and for some time forbade his appearance at court. In 1829, he was appointed viceroy of Sardinia. On the death of Charles Felix, 27th April, 1831, he ascended the throne. The liberals had great expectations from him, but were for a long time disappointed; his government much resembled the other Jesuitic and despotic Italian governments, except that he sought to promote the interests of the country, and to restrict the influence of the clergy in political affairs. It was not till after the elevation of Pius IX. to the popedom, when a new impulse was given to the cause of reform, that the Sardinian government adopted the constitutional and liberal policy to which it has since adhered. C. A. entered warmly into the project of Italian unity, and evidently expected to place himself at the head of the whole movement and of the new kingdom of Italy. When the Lombards and Venetians rose against the Austrian government, he declared war against Austria, 23d Mar., 1848, and at first was exceedingly successful, but was insufficiently supported by the Lombards, and finally defeated by the Austrians; so that after the fatal battle of Novara, 23d Mar., 1849, he was obliged, for the preservation of the integrity of his kingdom, to resign the crown in favor of his son, Victor Emmanuel. He afterwards retired to Portugal, and died at Oporto on 28th July of the same year.

CHARLES AUGUSTUS, 1757–1828, Grand Duke of Saxe-Weimar. He assumed the government in his eighteenth year, and the next year entered the Prussian army, in which he remained until the defeat at Jena in 1806, when he became a member of the Rhenish confederacy and furnished aid to the French. In 1813, he joined in the coalition against Napoleon, and took command of an army of Saxons, Hessians, and Russians. He fought among the allies in 1815, and the congress of Vienna rewarded his services by enlarging his principality and making it a grand duchy. Charles was an intimate friend of Goethe, Wieland, and other men of letters.

CHARLES the **BOLD**, Duke of Burgundy (1467–77), son of Philip the good, of the house of Valois, and of Isabella of Portugal, was b. at Dijon on10th Nov., 1435, and bore, during his father's life, the title of count of Charolais. He was of a fiery, ambitious, and violent

disposition. From an early period to the end of his life he was a declared enemy of Louis XI. of France, the nominal feudal superior of Burgundy. Louis having caused Philip to deliver up some towns on the Somme, C. left his father's court and formed an alliance with the duke of Bretagne and some of the great nobles of France for the maintenance of feudal rights against the crown. Their forces ravaged Picardy and Isle-de-France, they threatened Paris, and defeated the king at Montlhéry. The result was a treaty by which the count of Charolais obtained the towns on the Somme and the counties of Bologne, Guines, and Ponthieu for himself. In 1467, he succeeded his father as duke of Burgundy. Richer and more powerful than any prince of that time, he conceived the design of restoring the old kingdom of Burgundy, and for this purpose of conquering Lorraine, Provence, Dauphiny, and Switzerland. Whilst he was making preparations for war, Louis invited him to a conference; he hesitated, and Louis by his agents stirred up the citizens of Liege to revolt. Meanwhile C. consented to the conference, and the news coming of what had taken place at Liege, he seized the king, and if he had not been withheld by his councilor Comines, would have put him to death. He compelled Louis, however, to accompany him to Liege, and apparently to sanction the cruelties which he inflicted on the citizens. War raged between them afterwards with but little intermission till 1475. In Sept. of that year, C. found himself at leisure to attempt the prosecution of his favorite scheme of conquest, and soon made himself master of Lorraine. In the following year he invaded Switzerland, stormed Grandson, and hanged and drowned the garrison; but was soon after terribly defeated by the Swiss near that place, and lost his baggage and much treasure. Three months after, he appeared again in Switzerland with a new army of 60,000 men, and laid siege to Morat, where he sustained, on June 22, 1476, another and more terrible defeat. After this he sank into despondency, and let his nails and beard grow. But the news that the young duke René of Lorraine was attempting to recover his territories, roused him, and he laid siege to Nancy. His army was small; Italian auxiliaries, whom he had hired, went over to the enemy; and in the battle which he too rashly fought, he lost his life, Jan. 5, 1477. His daughter and heiress, Maria, married the emperor Maximilian I. With his life ended the long successful resistance of the great French vassals to the central power of the monarchy.

CHARLES CITY, a co. in s.e. Virginia, on the James and Chickahominy rivers; 184 sq.m.; pop. '80, 5512—3752 colored. Productions, corn, wheat, oats, etc. Co. seat, Charles City Court House.

CHARLES EMMA'NUEL I., duke of Savoy (1580–1630), called the great, was b. at the castle of Rivoli, 12th Jan., 1562, and succeeded his father Emmanuel Philibert in 1580. He married a daughter of Philip II. of Spain, and at first allied himself politically with Spain, and made war against France for the marquisate of Saluzzo (or Saluces), which he obtained in 1601, upon the cession of some other territories to France. But he afterwards joined France and Venice to oppose the preponderant power of Spain in Italy; then allied himself with the house of Hapsburg; and set up a claim to Montferrat, but suffered, in consequence, the direst calamities, great part of his dominions being conquered by the French, and in their hands when he died, 26th July, 1630. He was a prince of vast ambition, and for whom no enterprise was too bold.

CHARLES, surnamed **MARTEL**—i.e., the hammer—was the son of Pepin of Heristal, mayor of the palace under the last Merovingian kings, and was b. about 690 A.D. After his father's death in 714, he was proclaimed mayor of the palace by the Austrasian party. King Chilperic and he now quarreled, and a civil war arose which ended in C. becoming undisputed mayor of the palace and ruler of the Franks. During the latter years of his life, he indeed allowed the nominal throne to remain occupied — the titular kings being mere puppets in his hands. He was much engaged in wars against the revolted Alemanni and Bavarians, the Saxons, etc., but his importance as a historic personage is chiefly due to his wars against the Saracens, who, having conquered Septimania from the western Goths in 720, advanced thence into Aquitaine, conquered Bordeaux, defeated the duke of Aquitaine, crossed the Garonne, advanced to the Loire, and threatened Tours. C. defeated them between Tours and Poitiers in 732 in a great battle, in which their leader, Abd-ur-Rahmân, fell, and a stop was put to their progress in Europe, which had filled all Christendom with alarm. He defeated them again in 738, when they had advanced in the Burgundian territories as far as Lyon; deprived them of Languedoc, which he added to the kingdom of the Franks; and left them nothing of their possessions n. of the Pyrenees beyond the river Aude. He died on the 22d Oct., 741, at Quiercy on the Oise, in the midst of his victories, his projects, and his greatness, leaving the government of the kingdom to be divided between his two sons—Carloman, and Pepin the short.

CHARLES MIX, a co. in s.e. Dakota, on the Missouri river; pop. '70, 152, of whom 117 were Indians. Co. seat, Greenwood. '73, part set off to Douglass Co. Pop. '80, 403.

CHARLES RIVER, a stream rising in central Massachusetts, and flowing easterly to Boston harbor. It affords valuable water-power in many places, and in its lower course its banks are lined with large and small manufacturing villages.

CHARLES'S WAIN, a common name for the constellation of Ursa Major (q.v.).

CHARLESTON, a co. in e. South Carolina, on the ocean, and including several islands; 1906 sq.m.; pop. '80, 102,825—71,890 colored. The Santee river is the n.e. border, and the Ashley, Edisto, and Cooper rivers intersect the county. The surface is low and level, and much of the soil is very rich, producing sea-island and short staple cotton, rice, corn, sweet potatoes, etc. The South Carolina, the Savannah and Charleston, and the North-eastern railroads intersect. Co. seat, Charleston.

CHARLESTON, a village in Coles co., Ill., on the St. Louis and Indianapolis railroad, 35 m. w. of Terre Haute, Ind. It is the county seat, and has a medical college, some manufactures, and the trade of a productive agricultural district. Pop. '80, 2,849.

CHARLESTON, the chief city of a district of its own name in South Carolina, and the commercial capital of the state, is situated in lat. 32° 46′ n., and long. 79° 57′ west. With straight and regular streets, it occupies the fork of the Cooper and the Ashley, which, as deep tideways of the respective widths of 1400 and 2,100 yards, here unite with their common estuary of 7 m. in length to form Charleston harbor. This haven is beset to seaward by a sand-bar, which has its uses, however, as a breakwater and a bulwark. The more practicable of its two passages—showing 16 ft. at ebb and 22 at flood—is commanded by fort Moultrie and fort Sumter. The city is built upon ground raised but a few feet above the water. In 1860, the pop. of C. was 40,522; (1870) 48,956; (1875) 56,540. The exports, which are always of much greater value than the imports, amounted in 1858 to $16,924,436; in the year ending Mar. 31, 1875, $19,532,393. Cotton and rice are the chief exports. In 1878, the taxable property of C. was worth $26,591,778. The public debt was $4,716,754. There are about 40 churches, the state medical college, a large orphan asylum, etc. C. was founded in 1672, receiving from France, about 1685, a considerable influx of Protestant refugees. It was prominent for zeal and gallantry in the revolutionary war. Up to the time of the civil war, the city was remarkable for its suburban character and verdant surroundings, and its inhabitants were mainly opulent planters, distinguished for hospitality and refinement. It was in C., however, that the first open movement was made in favor of secession; and the city and its inhabitants have changed since then. In 1860 and 1861, the harbor was the scene of several conflicts; and in 1863, fort Sumter was reduced to ruins. The harbor was blockaded in 1861, and several dismantled hulks of vessels were filled with stones and sunk, in order to prevent passage. In spite of these precautions, however, more British blockade-runners entered this than any other southern port. In Aug., 1863, the city was bombarded, and in Feb., 1865, was occupied by the United States troops.

CHARLESTON (*ante*), the chief city of South Carolina and capital of Charleston co., stands upon a peninsula formed by the confluence of the Ashley and Cooper rivers, in lat. 32° 45′ n., long. 79° 57′ w., 7 m. from the Atlantic ocean. The harbor, formed by the junction of the two rivers, and land-locked on three sides, with a depth of water of from 40 to 50 ft., is one of the best on the coast. It is defended at the mouth by four fortresses, fort Moultrie, fort Sumter, castle Pinckney, and fort Ripley. The entrance to the harbor, on account of shifting sand-bars and the uncertain depth of the water, would sometimes be difficult were it not for the floating lights and bell-boats provided by the government. The water on the bar is only 18 ft. deep, but the channel is being deepened by the government. The city covers an area of more than 5 sq. m., has nearly 10 m. of water front, and more than 50 m. of streets. The latter intersect each other mostly at right angles, and some of them are spacious. The houses, instead of being built in blocks, are generally separated from each other by gardens, shade trees, and shrubbery, giving the city a peculiarly picturesque appearance, while greatly increasing its area. Charleston was founded in 1680 by an English colony. Its growth at first was slow, but with the development of the cotton traffic its commercial importance was greatly increased. The pop. '60 was 48,409, of which nearly one-half were colored. The war of the rebellion, which begun here in the spring of 1861 in the compulsory evacuation of Fort Sumter by the U. S. garrison under command of gen. Robert Anderson, and a great fire which occurred a few months later, paralyzed the business and greatly diminished the population of the city. Commerce indeed, between 1860 and 1865, was utterly destroyed. The wharves decayed, the docks were filled up, and the railroads leading into the interior were torn up. It was not until more than a year after the peace that the city was again made a port of entry; but from that time industry and commerce revived and have since steadily increased. The census of 1870 showed a very slight increase of population in comparison with that of 1860, the proportion of colored persons to white being about the same, 22 to 26. The population by the census of 1880 was 49,999; 24,005 being white, and 25,994 being colored. A large wholesale trade is carried on with the interior, an extensive region of country drawing its supplies of merchandise from this source. The overland trade with St. Louis, Chicago, and other cities of the north-west in flour, bacon, grain, etc., is rapidly increasing. Rice, cotton, lumber, naval stores, and phosphate rock are the principal exports. In the extent of the cotton trade, Charleston ranks next to New York and New Orleans. The manufacture of fertilizers from marl and phosphate rock has been developed since 1868 and is very extensive. Early vegetables, grown in the suburbs, are exported in large quantities to New York, Boston, and other northern cities. The whole amount of coastwise imports is very large and constantly increasing. Manu

factures of iron, wood, and phosphate, employ much capital, and afford occupation for upwards of 3,000 people. There are several large mills for removing the husk from rice and preparing it for market. A large portion of the rice raised in South Carolina and Georgia is cleaned at these mills. The valuation of property by the census of 1870 was over $50,000,000. The state assessment for 1872 was less than this by $10,000,000; the city assessment for 1873 was less by more than $20,000,000. In 1870 the number of dwellings was 6,861; the number of families, 9,098; the number of persons engaged in mechanical occupations, 18,705. There are seven banks of discount, with a capital of more than $3,000,000, and five savings banks, with deposits amounting to more than $1,000,000. The public squares are few and small, the battery near the water's edge, being the principal public resort. There are 3 daily and 5 weekly newspapers, and about 40 churches, of which 11 are Episcopal, 8 Presbyterian, 5 Roman Catholic, 5 Methodist, 4 Baptist, 3 Lutheran, and 1 Unitarian. The most noted church edifice is St. Michael's (Episcopal), built in 1752. It has a fine chime of bells, and its tower can be seen far out at sea. St. Philip's is the oldest church organization, but its house of worship is not so old as that of St. Michael's. In the graveyard adjoining St. Philip's lie the remains of many noted persons, including Gadsden, Rutledge, Pinckney, and Calhoun. Magnolia cemetery, near the northern boundary of the city, contains many fine monuments. The principal benevolent institutions are the orphan house, with an endowment of $190,000, and over 300 inmates; the Roman Catholic orphan asylum, with more than 100 inmates; the almshouse; the asylum for the aged and infirm; the city hospital; and an asylum for colored orphans, supported by the state. The principal public buildings are the U. S. arsenal and citadel, the market, city hall, court-house, orphan house, academy of music, custom-house, post-office, Charleston hotel, and Mills house. Three steam railroads have their center here, and there are horse railroads connecting the different parts of the city with each other. The streets are lighted with gas, and many of them are well paved. The schools of the city are under the control of commissioners elected by the people and a superintendent appointed by the commissioners. In 1872, there were 8 public schools (5 grammar and 3 primary); number of children of school age, 12,727, of whom 5,068 were enrolled; number of teachers 68, all but four of them males; total school expenditures over $40,000 annually. There are also a considerable number of private schools. Charleston college, founded in 1775, in 1872 had 5 instructors, 50 students, and a library of 8,000 volumes. The state medical college, at the same date had 9 professors. The Charleston library, founded in 1748, has 14,000 volumes, and the apprentices' library is a valuable collection. Charleston was among the first of the principal places in the south to enlist in the revolutionary struggle of 1776. It was captured May 12, 1780, after a siege of six weeks, by 12,000 British regulars under sir Henry Clinton, and evacuated Dec. 14, 1782. It was the center of the nullification movement of 1830, which was put down by Andrew Jackson; and the war of the rebellion had its beginning here in the bombardment of Fort Sumter, which aroused the northern people to a stern resistance. The city remained in the possession of the confederates until the surrender of Columbia, the state capital, to Sherman, when it was evacuated by the confederate forces, and all the public buildings, stores, cotton warehouses, shipping, etc., were fired by order of gen. Hardee, the confederate commander. When the union forces took possession, Feb. 18, 1865, they did all that they could to rescue the city from destruction. During the war many buildings were destroyed, and the towers and steeples of the churches riddled with shot and shell.

CHARLESTON (Post office, KANAWHA COURT-HOUSE), the capital of West Virginia, on the Chesapeake and Ohio railroad and the Kanawha river, at the junction of Elk river; 130 m. s.w. of Wheeling; pop. '70, 3,162. The Kanawha is navigable to the Ohio. Charleston is in a region productive of timber, coal, iron, and salt, and is an important shipping point. The salt springs are just above the city on both sides of the river, and more salt is made here than in any other place in the country except Syracuse, N. Y. The state-house is the most conspicuous building. There are a Roman Catholic seminary, and several high schools. The seat of the state government was fixed here April 30, 1870.

CHARLESTOWN, a seaport of Massachusetts, in lat 42° 2′ n., and long. 71° 3′ w. It occupies a peninsula about 2 m. long, immediately to the n. of Boston, the capital of the state; of which, connected as the two are by bridges, it is virtually a suburb. Pop. in 1850, 17,126; in 1860, 25,063; in 1870, 28,323. In common with the rest of the neighborhood, the peninsula displays an unevenness of surface which renders the streets, otherwise handsome, somewhat irregular. Its most prominent height is Bunker's hill, celebrated as the first battle-field in the revolutionary war, and surmounted, in 1825–43, by a granite monument of 220 ft. in height. Besides a state-prison on a large scale, the city possesses one of the principal navy-yards of the general government. This establishment, covering 60 acres, contains a magnificent ropewalk 1300 ft. long, and a dry-dock of chiseled granite measuring 80 ft. in breath by 30 in depth. C. was incorporated with Boston in 1874.

CHARLESTOWN (*ante*), now part of Boston, formerly a city of Middlesex co., Mass. It is situated on the northern bank of the Charles river, and is connected with Boston by two free bridges. The Mystic river, which unites with the Charles at this

point, forms the boundary on the e. and north. The pop. in 1873, when the city was annexed to Boston, was 28,373. From the territory of Charlestown, originally very large, several towns have been taken on its northern side. The surface of the remaining portion is very uneven; two eminences, Bunker and Breed's hills, rising near the center, and affording many fine building sites. On Bunker hill was fought a celebrated battle of the revolution, June 17, 1775, commemorated by a granite shaft erected on the summit and rising to the height of 220 feet. The corner-stone of this monument was laid in 1825 by gen. Lafayette, and the work was finished in 1843. The attempt of the Massachusetts committee of safety to fortify this eminence was the immediate occasion of the battle, in the course of which the town was burned by the British, being set on fire by shells from Copp's hill in Boston, and by men who were sent across the Charles for that purpose. C. is well built, having some fine streets and residences. It has an abundant supply of water from Mystic lake, excellent schools, 15 churches of various denominations, a public library of 15,000 volumes, a fund of $23,000 for the benefit of the poor, and a home for aged and indigent women. The state prison was located here from 1805 to a very recent period, and the buildings used for that purpose are still standing. A navy-yard of the United States, covering more than 70 acres of ground and having all the appointments required for such an establishment, has existed here since 1798. C. is also a place of considerable business. It has manufactories of steam engines, boilers and machinery, of stone and brass-ware, gas fixtures, mechanics' tools, leather, draw-pipes, sugar, soap, etc.

CHARLESTOWN, the seat of justice of Jefferson co., W. Va., on a branch of the Baltimore and Ohio railroad, 10 m. s.w. from Harper's Ferry; pop. '80, 2016. It is in a fine agricultural district. It was in this village that John Brown was tried, condemned, and hanged Dec. 2, 1859.

CHARLET, Nicolas Toussaint, a French painter and engraver, b. in Paris, 1792, was for some years employed as a clerk in a government office, but lost his place at the restoration, 1815, on account of his Bonapartism, and in consequence betook himself to art. After studying awhile under Gros, he gradually formed for himself a style in which he had no rival. C. is the Béranger of caricature, but without the political bitterness and sarcasm sometimes found in the poet. His genial sketches of French life and manners were studied with equal admiration in the salons of the aristocracy and in the ateliers, barracks, taverns, etc., of the lower classes. C. was especially successful in his sketches of soldiers and children. His designs are free from exaggeration, while full of spirit, interest, and naïveté; and his titles or mottoes were often so witty and suggestive, that dramatic writers have founded pieces upon them. His sketches and lithographs are very numerous, and are widely distributed. Among his paintings, the most remarkable are—"An Episode in the Russian Campaign" (in the museum at Versailles); "Moreau's Crossing of the Rhine" (at Lyons); and a "Procession of the Wounded" (at Bordeaux). C. died in 1845.

CHARLEVILLE, a t. of France, in the department of Ardennes, about a mile from Mezières, with which it communicates by a suspension bridge over the Meuse. It is a thriving place, well built, with clean spacious streets. It has manufactures of hardware, leather, and beer, and the Meuse affords facilities for considerable trade in coal, iron, slate, wine, and nails. Pop. '76, 12,881.

CHARLEVOIX, a co. in n.w. Michigan, on lake Michigan and Green river; 500 sq.m.; pop. '80, 5114. Grand Traverse bay bounds the county on the w., and Little Traverse bay on the north. The chief business is agriculture. Co. seat, Charlevoix.

CHARLEVOIX, a co. in the province of Quebec, Canada, forming a triangle, one side of which runs 80 or 90 m. along the n.w. bank of the St. Lawrence, reaching nearly to the Saguenay river; 5,224 sq.m.; pop. '71, 15,611, of whom all but nine were Roman Catholics. The surface is mountainous, and not well adapted to agriculture. It is intersected by five or six rivers that fall into the St. Lawrence, and one that joins the Saguenay. Chief town, Baie St. Paul.

CHARLEVOIX, Pierre François Xavier de, 1682–1761; a French Jesuit who was sent as a teacher to Quebec in 1705. After about five years he returned to France, and became professor of belles-lettres. He returned to Canada in 1720, and journeyed up the St. Lawrence and the lakes and down the Illinois and Mississippi to New Orleans, and thence went to Paris. His principal work is a valuable *History of New France* (or Canada), which was not published in English until 1865. He also wrote a history of Christianity in Japan, and a history of Paraguay.

CHARLOCK. See Mustard.

CHARLOIS, a village of the Netherlands, situated on the Maas, about 2 m. s.s.w. of Rotterdam. It is memorable on account of a terrible accident which occurred here in 1512, when a religious procession crossing the ice in defiance of magisterial prohibition, 8,000 of them were precipitated into the Maas. Pop. 2,000.

CHARLOTTE, a co. in s. Virginia, on Staunton river; intersected by the Atlantic, Mississippi and Ohio, and Richmond, Danville and Piedmont railroads; 550 sq.m.; pop. '80, 16,653—10,908 colored. Surface hilly; productions, wheat, corn, oats, and tobacco. Co. seat, Marysville.

CHARLOTTE, a co. in s.w. New Brunswick, on the Maine border and the bay of Fundy; 1323 sq.m.; pop. '71, 25,882. The county is traversed by the New Brunswick and Canada, and the North American and European railroads. Ship-building and sea-fishing are the occupations of the greater portion of the inhabitants. Chief town, St. Andrews, at the mouth of St. Croix river.

CHARLOTTE, the seat of justice and an incorporated city of Eaton co., Mich., 20 m. s.w. of Lansing, on Grand River Valley division of the Michigan Central, at the crossing of the Peninsular railroad; pop. '80, 2,910. Lumber and agricultural products furnish the greater part of its trade.

CHARLOTTE, a city of North Carolina, the seat of justice of Mecklenburg co , on Sugar creek, and the Wilmington, Charlotte and Rutherford railroad, at the terminus of the North Carolina division of the Richmond and Danville, and the Charlotte, Columbia and Augusta railroads. The city is in the North Carolina gold region, and a mint was established in 1838, but closed in 1861 on account of the rebellion. Up to that date more than $5,000,000 in gold had been deposited in the mint. There are several manufactories in the city. It was here that the "Mecklenburg Declaration of Independence" was adopted, May 31, 1775. C. has a univ. and graded schools. Pop. '80, 7094.

CHARLOTTE AMALIE, chief, or rather only, town of St. Thomas, one of the Virgin group of the Antilles, in lat. 18° 20′ n., long. 64° 55′ west. It contains 11,400 inhabitants, nearly three fourths of the entire population of the colony. It has a spacious harbor, which, besides being largely visited by European ships in general, is a principal station for the mail-packets between Southampton and the West Indies.

CHARLOTTE AUGUSTA, 1796–1817; daughter of George IV. and queen Caroline of England. She was well educated under the care of the bishop of Exeter and Lady Clifford. It was desired that she should wed the prince of Orange, but she loved and married prince Leopold of Saxe-Coburg, who, long after her death, became king of Belgium. She was married May 2, 1816; was delivered of a still-born child early in Nov. of the next year, and died, in consequence of malpractice, as was believed. Her officiating physician committed suicide. Her domestic life was most wretched, as her published letters show.

CHARLOTTE HARBOR, or Boca Grande, an inlet in the gulf coast of Florida, 25 m. long, and 8 to 10 m. wide, with an entrance three fourths of a mile wide, and 30 to 40 ft. deep. There is a good harbor, sheltered from the sea by a number of islands. Wild fowl, fish, and oysters are plentiful.

CHARLOTTENBURG, a t. of Prussia, in the province of Brandenburg, is situated on the Spree, 3 m. w. of Berlin, with which it is connected by a road leading through the *Thiergarten*, and affording a favorite promenade to the Berliners. C. contains a royal palace, with a fine garden and splendid orangery, and an interesting collection of antiquities and works of art. In a beautiful part of the park a mausoleum, designed by Schinkel, contains the remains of Frederick William III. and his wife, the queen Luise, with their statues by Rauch. C. has manufactures of cotton and hosiery. Pop. '71, 19,518; '80, 30,446.

CHARLOTTESVILLE, a village in Albemarle co., Va., 65 m. n.w. of Richmond, on the Orange, Alexandria and Manassas, and the Chesapeake and Ohio railroads. The place is the seat of the university of Virginia, founded by Thomas Jefferson; and Monticello, Jefferson's home, is but 3 m. distant. Pop. '80, 2,676.

CHARLOTTE TOWN, the capital of Prince Edward island, in the gulf of St. Lawrence, in lat. 46° 15′ n., and long. 63° 7′ west. The census of May, '81, states the pop. at 11,485. The port is the best in a colony which, in proportion to its size, is remarkable for its navigable facilities. The town stands on the s.e. coast at the bottom of Hillsborough bay, and at the confluence of three rivers, which each admit the largest vessels for several miles, so as to secure them from all weather. The harbor is rendered still more commodious through the strength of the tides, which enable ships to work out and in against the wind. C. T. has an iron foundry and a woolen factory, and is largely engaged in ship-building.

CHARLTON, a co. in s.e. Georgia, on the Florida border, including a portion of the great Okefenoke swamp; 1000 sq.m.; pop. '80, 2161—361 colored. Productions, rice, cotton, tar, and turpentine. Surface level and soil sandy. Co. seat, Trader's Hill.

CHARM (Lat. *carmen*, a song), properly, a form of words, generally in verse, supposed to possess some occult power of a hurtful, a healing, or a protective kind. Charms exert their influence either by being recited, or by being written and worn on the person; and, in this latter case, they may be classed with amulets (q.v.). The nature of this superstition will be more fully considered under Incantation; see also Magic.

CHARNEL-HOUSE (Fr. *charnier;* Lat. *caro*, flesh), a chamber situated in a churchyard or other burying-place, in which the bones of the dead which were thrown up by the grave-diggers were reverently deposited. The C. was generally vaulted in the roof, and was often a building complete in itself, having a chapel or chantry attached to it. In such cases, the charnel-vault was commonly a crypt under the chapel; and even in

churches, it was not uncommon for the vault or crypt to be employed as a charnel-house.

CHARNOCK, Stephen, d.d., 1628–80; an English non-conformist minister, educated at Cambridge. He began to preach in London, and went thence to Dublin, where he was successful. In 1660, he was silenced by the act of uniformity, and returned to London; he continued 15 years in and near that city, preaching, but without a settled congregation. Many of his sermons have been published, and his work on the *Attributes of God* is still highly valued. He was a vigorous and original, as well as judicious thinker; and as a writer he was vivid and clear.

CHARON, in classical mythology, the son of Erebus and Nox, is first mentioned by the later writers of Greece. His duty was to ferry the shades of the buried dead across the rivers of the under-world. For this service, he exacted an *obolus* from each, and in consequence, a coin of this kind was placed in the mouth of the dead. If this rite was neglected, C. refused to convey the unhappy shade across, and it was doomed to wander restlessly along the shores of Acheron. C. is generally represented as a gloomy old man, with a rough beard and wretched clothes. In the Etruscan monuments, he holds a hammer.

CHARON'DAS, a lawgiver of ancient Greece, by some supposed to have been a disciple of Pythagoras. It is related that he fell a sacrifice to one of his own laws, by which it was made a capital offense to appear armed in a public assembly. On returning from a military expedition he hastened to quell a tumult, having his sword at his side. Being reminded by a citizen of his law, he replied, "Then I will seal it with my blood," and immediately plunged his sword into his breast.

CHAROST, Armand Joseph de Bethune, Duc de, 1810–65; a descendant of Sully, the famous marshal. C. took part in the revolution of 1830 as a republican, and in 1833 was made a lieut. Afterwards he served in Algeria, and after the revolution of 1848 he was appointed under secretary of state. He was one of the zealous republicans in the national assembly, and one of the victims of Dec. 2, 1851, being imprisoned at Ham, and afterwards exiled to Belgium. In 1854, Napoleon III. expelled him from France, and he went to Holland and afterwards to Switzerland. He wrote a history of the campaign of 1815, in which he severely criticised Napoleon's generalship, and a history of the war in Germany in 1813.

CHARR, *Salmo umbla*, a fish of the same genus with the salmon, occurring in the lakes of Britain and of the continent of Europe. It is abundant in the lakes of Cumberland and Westmoreland, and in some of those of Ireland, of the n. of Scotland, and of Orkney, but in the greater number of the Scottish lakes it is not found. It is the celebrated *ombre chevalier* of the lake of Geneva. It is sometimes found weighing more than 2 lbs., but is generally under 1 lb. in weight. It has only the anterior part of the *vomer* (the middle line of the palate) furnished with the teeth, agreeing in this with the salmon and bull-trout, and differing from the common trout, salmon-trout, etc. The form is elongated, the greatest depth of the fish about one fifth of the entire length; the fins are rather small; the tail deeply forked; the color of the back dark olive, the sides lighter and spotted with either red or white, according to the condition in which the fish is at the time, the belly also being sometimes deep orange, and sometimes of a pale color; these, and other accidental variations, causing the fish to receive different names, such as *case C.*, *red C.*, *gilt C.*, *silver C.*, and having led some naturalists to believe in the existence of different species. It is not yet quite certain whether the *torgoch* or *red-belly* of Wales (*salmo salvelinus* of some authors) ought to be regarded as distinct or as a mere accidental variety. Whilst it is the most delicious perhaps of the *salmonidæ*, the C. is also the most beautiful; its rich purple, rosy, and crimson tints and white spots rendering it indeed a brilliant and striking object. During summer, the C. haunts chiefly deep cool water, and is seldom seen at the surface till late in autumn. It feeds on insects and minute crustaceans. In the end of autumn or beginning of winter, it ascends rivers to spawn, always choosing those which have a rocky bottom. Whether in lake or stream, it is only to be found in clear waters. Unfortunately, the C. of the English lakes is taken in great numbers, by nets, at the mouths of streams, when about to ascend them in order to spawn, and when not in the best condition for the table.

On some lakes, vast quantities are then caught for the table, particularly for the purpose of potting. A C. is now and then taken with fly when the angler may be whipping a lake, which perhaps abounds with them, for trout; but this occurs but seldom. The C. will, too, occasionally take a minnow, if sunk deep and trailed slowly; but the sport it affords is of the most precarious nature. C. are fast diminishing in those of our English lakes which they still inhabit, owing to the wholesale and indiscriminate slaughter which occurs at the spawning season. A large kind of C., sometimes reaching 4 lbs. in weight, is found in some of the more northern Swedish lakes.

CHARRIÈRE, or CHARRIÈRES, Isabelle Agnète de Saint-Hyacinthe de, 1740–1805; a native of Holland, daughter of a Dutch baron, and married to a Swiss, who had been her brother's teacher. In 1786, appeared her most important book, *Caliste*, or *Letters Written in Lausanne*. She traveled in France and England, and was

an intimate friend of Benjamin Constant. She was a brilliant and beautiful woman, but, owing to loss of her estate, the latter years of her life were spent in strict seclusion.

CHARRON, Pierre, 1541–1603; a French philosopher, one of the 25 children of a bookseller of Paris. He studied law at Bruges, and began practice in Paris, but not having immediate success, he went into the church, and rose to eminence as a preacher. At Bordeaux he formed a short but famous and important friendship with Montaigne, who, on his death in 1592, requested C. to bear the arms of the Montaigne family. In 1594, C. published *Le Trois Verites*, in which he seeks to prove that there is a God and a true religion, and that the true religion is the Roman Catholic. This was followed by a book of sermons, and in 1601 came his most remarkable work, *De la Sagesse*, a complete popular system of moral philosophy. This work brought upon its author the most violent attacks, but a second edition was soon called for. This, after much opposition, began to appear in 1603, but only a few sheets had been printed when C. died suddenly in the street.

CHART, a marine or hydrographical map, exhibiting a portion of a sea or other water, with the islands, coasts of cotinguous land, soundings, currents, etc. See Map. In the English service, when coasts have been surveyed by the admiralty, charts are engraved, and are sold at various prices, from 3*s.* down to 6*d.* each. This price is below their cost, the object being to encourage their general use as much as possible. Men-of-war are supplied with copies of every available C. published, relating to the regions likely to be visited. There is a printed list for every station. At Gibraltar and the cape of Good Hope, there are depots of charts to supply ships whose destination undergoes a change. All the charts are brought home again, and none are reissued until revised and corrected. The navigating charts, showing the dangers of coasts, with sufficient clearness to enable mariners to avoid them, are generally on the scale of half an inch to a mile; those of larger size show all the intricacies of the coast. The merchant-service is supplied with charts by agents, who receive a stock from the admiralty, and keep them on sale. The preparation of charts is part of the duty of the hydrographical department of the admiralty. In the financial year 1879–1880, a sum of no less than £11,000 was provided for this branch, quite irrespective of the surveying that preceded the engraving of the charts, which always costs a much larger sum. In the five years ending with 1875, the admiralty sold 495,445 charts, besides supplying the queen's ships.

CHARTA, Magna. See Magna Charta.

CHARTE (Fr. a charter; Lat. *charta*, paper). In the sense in which we have adopted this word from the French, and in which it may be now said to form part of our language, it signifies a system of constitutional law, embodied in a single document. Whether any system of positive public law existed in ancient France is, in that country, a subject of keen dispute amongst constitutional antiquaries. If any such there was, there seems little doubt that it was the mere embodiment of traditions, and not the result of any single act of the national will. Whilst France was divided into provinces and communes, local liberties and privileges unquestionably existed; but where the nation constituted no single body, a constitutional charter was impossible. The first traces of such a C. appear in the 14th c.; and it is known in the history of the public law of France as the *grand charter*, or the charter of king John. Up to this time, the kings had called together only partial assemblies, but in 1355 deputies from the whole kingdom were assembled in the hall of the parliament of Paris. The nobility and clergy, secular and regular, were represented by 400 deputies, the commons or third estate by a like number. This body assumed to itself the initiative, and prepared a species of constitution, which was accepted by the king. The chief triumph of the third estate on this occasion consisted in carrying through the doctrine, that the decision of any two estates should be invalid without the concurrence of the third. The three orders, who seem to have composed but one assembly, then proceeded to impose a series of restrictions on the power of the monarch, which, confirmed by the dauphin two years later, formed the foundation for the liberties subsequently asserted at the revolution.

But the constitution to which the term C. is most frequently applied by the French and by us, is that in which Louis XVIII. solemnly acknowledged the rights of the nation on his restoration in 1814. This C. has ever since been considered the fundamental law of constitutional monarchy when that form of government has existed in France. In some of its provisions, however, and still more in the mode of its acceptance by the monarch, as "a voluntary and free act of our royal authority," and as a "concession made to," not a contract entered into with, his subjects, it was open to the misconstructions which eventually led to the revolution of 1830. The "charte" sworn to on the 29th Aug. of that year by king Louis Philippe modified this and some of the other provisions of that of 1814. On that occasion, the king explicitly recognized the sovereignty of the people. This document, which, with some modifications, remained in force till the revolution of 1848, is of so much importance, not only from its bearing on the past history, and possibly on the future destiny of France, but from the analogies which it presents to our own constitution, that we shall endeavor to present a condensed view of its leading provisions.

It consisted of 67 articles, divided into 7 heads. Of these, the 1st head, containing 11 articles, treated of the public rights of the French people It provided for the equality of all Frenchmen—a doctrine which it inherited from the revolution, and which it unfortunately left to be understood in a sense inconsistent with monarchy, and indeed with any other form of government than pure democracy (see EQUALITY)—for their equal admissibility to all employments, civil and military, and for their freedom from arrest, otherwise than by legal process. It guaranteed the enjoyment of religious liberty, and the payment of the ministers of all Christian denominations—a privilege which in 1831 was extended even to Jews. The liberty of printing and publishing was insured, the censorship of the press and conscription were abolished, an amnesty for all political offenses was proclaimed, and the security of property guaranteed, except when its sacrifice should be requisite for the public good, in which case it was declared that the owner must be indemnified. The 2d head set forth the nature and limitations of the kingly power in 8 articles. The supreme executive power, the command of the army and navy, and the right of making war, and treaties of peace, alliance, and commerce, were reserved to the monarch. To him, also, it belonged to nominate to all offices of public administration, to make all necessary regulations for the execution of the laws, but in no case to suspend them or dispense with them. The high duties of legislation were shared between the king, the chamber of peers, and the chamber of deputies; it being provided that every law should be agreed to by a majority of each chamber, and sanctioned by the king. Any one of the three branches of the legislature might originate any bill, except a money-bill, which was reserved for the chamber of deputies, as for the house of commons in England. The 3d head contained ten articles regarding the chamber of peers, the nomination of whom was vested in the king (the princes of the blood being peers by right of birth). No limit was set to their number; but by the law of 9th Dec., 1831, incorporated in the C., it was declared that their dignity should be for life only. The chancellor of France was president. The chamber of peers assembled simultaneously with that of the deputies, and its sittings were public. The personal privileges of the peerage, as they exist in England, were introduced. The 4th head concerning the chamber of deputies contains 16 articles. It provides for the election of the deputies and the sittings of the chamber. The electoral qualification is declared to be the payment of 200 francs of direct taxes, whilst that of a deputy is the payment of 500. The voting is by ballot, both at elections and in the chambers. The number of deputies, which at first was 430, was afterwards raised to 459. Each deputy was elected for 5 years, and one half of those for each department were required to have their political domicile within it. The C. became a nullity by the revolution of Feb., 1848; and by the new constitution promulgated on the 4th of Nov. of that year, the monarchy of France was converted into a democracy. By chapter 4 of that document, the legislative power was vested in a single assembly of 950 members, including the representatives of Algeria and the other colonies. The property electoral qualification was abolished, and the age reduced for electors to 21, and for delegates to 25. The period of three years was fixed for the continuance of the national assembly. By chapter 5, the executive power was intrusted to a citizen, who was to bear the title of president. He was not to be less than 30 years of age, his tenure of office was to be 4 years, and he was not to be re-eligible until after an interval of 4 years. For an account of the subsequent changes by which these and the other arrangements adopted at the revolution of 1848 have since been superseded, see FRANCE.

CHARTER (Lat. *charta;* Gr. *chartes*, paper, or anything written upon, from *charasso*, to scratch or write). In its most general signification, C. is nearly synonymous with *deed* and *instrument*, and is applied to almost any formal writing, in evidence of a grant, contract, or other transaction between man and man. In private law, its most important use is in the alienation of real estates, the writing given to the new proprietor by the old, in proof of the transference title, being usually called a charter. In public law, the name is given to those formal deeds by which sovereigns guarantee the rights and privileges of their subjects, or by which a sovereign state guarantees those of a colony or other dependency. See CHARTE, MAGNA CHARTA. There is another sense of the term, in which it is in a measure intermediate between the two we have mentioned—viz., where we speak of the C. of a bank or other company or association. In this latter sense it signifies an instrument by which powers and privileges are conferred by the state on a select body of persons for a special object. See BANK, CORPORATION, JOINT-STOCK COMPANY, etc. The requisites of a C., when used in the first of these significations, according to the law of England, will be pointed out under DEED.

ROYAL CHARTERS, generally written in Latin, are of two kinds: I. Grants of lands, houses, honors, or liberties to persons who did not previously possess them; II. Charters confirming grants previously made, and therefore called "charters of confirmation." Confirmation charters are of three kinds: 1. Charters confirming previous grants, without reciting them; 2. Charters of simple confirmation, without addition of anything new; 3. Charters reciting previous charters and confirming them, with addition of something new. These last two classes of charters are called charters of "inspeximus," or "vidimus," from the word used by the granter in saying that he has seen the C. which he confirms. Royal charters generally contain seven clauses: 1. The "premises."

i.e., the name and style of the granter, the persons to whom the C. is addressed, the name and style of the grantee, the reason why the grant is made, and the description of the thing granted, 2. The "tenendum and habendum," i.e., the way in which the thing granted was to be held and had; 3. The "reddendo," the return of rent or service which was to be made to the granter by the grantee; 4. The "quare volumus," or order that the grantee should have the thing granted, under certain penalties; 5. The "sealing" or "signature" clause, setting forth the seal, signature, or subscription by which the C. was authenticated; 6. The "hiis testibus," or testing-clause, enumerating the persons who were present as witnesses when the C. was granted; 7. The "date," setting forth the time when, and the place where, the C. was granted.

CHARTER, in the law of Scotland, is the written evidence of a grant of heritable property, under the conditions imposed by the feudal law—viz., that the grantee, or person obtaining, shall pay at stated periods a sum of money, or perform certain services to the granter, or person conferring the property. A C. must be in the form of a written deed. The granter of a C., in virtue of the power which he thus retains over the property and its proprietor, is called the superior; and the grantee, in consequence of the services which he undertakes to render, the vassal; whilst the stipulated sum to be paid or service to be rendered, is called the duty.

Charters are either blench or feu, from the nature of the service stipulated—*a me* or *de me*, from the kind of holding or relation between the granter and grantee; and original or by progress, from being first, or renewed, grants of the subjects in question.

Blench and Feu Charters.—The duty which the superior required of his vassal in former times was almost always military service, and the vassal was then technically said "to hold ward"—to hold on condition of warding or defending his superior. But subsequent to the rebellion of 1745, in which the dangerous tendencies of the feudal relation were experienced, this holding was abolished (20 Geo. III. c. 50), and the only duties which it has since been lawful to insert in C. are *blench* and *feu* duties. The former is a merely nominal payment—a penny Scots, a red rose, or the like, *si petatur tantum* (should it be asked); the latter is a consideration of some real value. Original blench C. having lost all object, and having no other effect but that of subjecting superiors to considerable expense in keeping up their titles, have become rare in modern practice. The forms of charters varying according to the circumstances in which they are granted, and the relations established between the granter and grantee, are of too technical a nature to admit of explanation in this work. They will be found very clearly and shortly stated in Bell's *Law Dictionary*, voce "Charter."

CHARTER-HOUSE (a corruption of *Chartreuse*, i.e., Carthusian) is a hospital, chapel, and school-house, in London, instituted in 1611 by sir Thomas of Sutton, Camps castle, in the co. of Cambridge. It had originally been a Carthusian monastery (founded in 1371 by a sir Walter Maüny and the bishop of Sudbury), but on the dissolution of monastic establishments by Henry VIII., it was made a place of deposit for his nets and pavilions. After undergoing many alterations, and passing into the possession of various distinguished persons, it was finally purchased from lord Suffolk, for £13,000, by sir Thomas Sutton, who endowed it with the revenues of upwards of 20 manors, lordships, and other estates, in various parts of England. This "masterpiece of Protestant English charity," as old Fuller calls it, serves three uses—it is an asylum for poor brethren, an educational and a religious institution; hence Bacon terms it a "triple good." The *poor brethren* are 80 in number. None are admitted under 50 years of age, and only those who have been housekeepers are eligible. Each brother has a separate apartment, a share of attendance from domestics, an ample, though plain diet, and an allowance of about £26 a year for clothes and other matters, and four weeks' holiday every autumn. The brethren must be bachelors and members of the church of England. Among the poor brethren in by-gone years were Elkanah Settle, the antagonist of Dryden; John Bagford, the antiquary; Isaac de Groot, a descendant of Grotius; and Alexander Macbean, who assisted Johnson in the preparation of his dictionary. The *scholars* are 44 in number, admissible between the ages of 10 and 14. They are understood to be "the sons of poor gentlemen to whom the charge of education is too onerous;" as in the case of the *poor brethren*, it is not always the proper parties who are chosen. There are exhibitions, scholarships, and medals competed for at certain times by the scholars. In addition to the scholars properly so called, i.e., such as receive a free board and education, a large number of youths are sent to the charter-house school because of its reputation. These either board with the masters, or simply attend during the day. The number of extra boarders is nearly double that of the scholars. The institution is under the direction of the queen, 15 governors, selected from great officers of the state, and master himself, whose salary from the foundation is £800 per annum. Among the eminent individuals educated in this establishment, are Dr. Barrow, Judge Blackstone, Addison, Steele, John Wesley, bishop Thirlwall, George Grote, W. M. Thackeray, and sir Charles Eastlake.

The charter-house, which is situated at the upper end of Aldersgate street, is a quaint old building, interesting, though not very beautiful. The chapel contains Sutton's tomb, which was opened in 1842, when the body of the founder was discovered in a coffin of lead adapted to the shape of the body, like an Egyptian mummy-case.

CHARTER OAK, a famous tree that stood in Hartford, Conn., until blown down by a storm, in Aug., 1856. Its name was given because when sir Edmund Andros, governor of New England and New York, came to Hartford in 1687, by the order of James II., to demand the colonial charter, that document was hidden in a hollow of the tree by capt. James Wadsworth, and thus preserved. Though some writers have cast doubt on this interesting tradition, it is generally accepted by historians.

CHARTER-PARTY (Fr. *chartre-partie*, so called from such documents being at one time divided—in Fr. *parti*—and one half given to each party concerned), the title given to a contract in which the owner, or master of a ship, with consent of the owner, lets the vessel, or a portion of her, to a second party, for the conveyance of goods from one port to another port; hence the vessel is said to be *chartered*. The document must be stamped. It must specify the voyage to be performed, and the terms on which the cargo is to be carried. On the part of the ship, it is covenanted that she shall be seaworthy; well-found in rigging, furniture, and provisions; and that the crew be suitable in number and competency; that she shall be ready to receive the cargo on a given day, wait its complete delivery for a certain period; and sail for the stipulated port when laden, if the weather for the time permits. The freighter's portion of the contract obliges him to load and unload at suitable periods, under specified penalties, and to pay the freight as agreed on. The master must not take on board any contraband goods, or otherwise render the vessel liable to seizure. The owner is not responsible for losses caused by war, fire, or shipwreck, unless arising from negligence of the master or crew.

CHARTIER, Alain, the most distinguished man of letters in France in the 15th c., supposed to have been born about 1380. After studying at the university of Paris, he is supposed to have entered the service of Charles VI., and after that to have followed the fortunes of Charles the dauphin, afterwards Charles VII. The lot of C. was cast in troubled times; he felt the agony of Agincourt, and saw the rise of the maid of Orleans. The story of the famous kiss bestowed by Margaret of Scotland, wife of that Louis the dauphin who was afterwards to be known as Louis XI., "on that precious mouth from which has issued so many witticisms and virtuous sentences," is interesting if only as a proof of the high degree of estimation in which the ugliest man of his day was held. His best works are said to be *Le Livre des Quartre Dames*, which was called forth by the battle of Agincourt, and *Le Quadriloque-Invectif*, a patriotic dialogue.

CHARTISM, a movement in Great Britain for the extension of political power to the great body of the people, arising in a great measure out of wide-spread national distress and popular disappointment at the results of the reform bill. Prior to 1831, the middle classes had sought popular aid towards obtaining their own enfranchisement. The assistance was given, the people expecting to receive help in their turn. After the passing of the reform bill, agitation ceased for a time, and the members returned to parliament were indifferent, or opposed, to any further change in the political arrangements of the country. The middle classes were satisfied with their own success, and generally looked with small favor on projects for the further extension of political influence among the masses. A season of commercial depression set in about 1835, and failing harvests for several years terribly increased the sufferings of the people. Food became dear, wages fell, manufactories were closed, work became scarce. The people associated their sufferings with their want of direct influence upon the government, and agitation for an extended franchise began. In 1838, a committee of 6 members of parliament and 6 working-men prepared a bill, embodying their views as to what were just demands on the part of the people. This was the "people's charter." It claimed—1. The extension of the right of voting to every (male) native of the United Kingdom, and every naturalized foreigner resident in the kingdom for more than two years, who should be 21 years of age, of sound mind, and unconvicted of crime; 2. Equal electoral districts; 3. Vote by ballot; 4. Annual parliaments; 5. No property qualification for members; and 6. Payment of members of parliament for their services. This programme was received with enthusiasm. Immense meetings were held all over the country, many of them being attended by two or three hundred thousand people. Fiery orators fanned the popular excitement, and under the guidance of the extreme party among their leaders, physical force was soon spoken of as the only means of obtaining justice. The more moderate and thoughtful of the chartists were overruled by the fanatical and turbulent spirits, and the people, already aroused by suffering, were easily wrought into frenzy by those who assumed the direction of their movements. In the autumn of 1838, torch-light meetings began to be held. The danger of these meetings was obvious, and they were at once proclaimed illegal. Some of the more prominent leaders were arrested, amid intense popular excitement, and subjected to various terms of imprisonment. A body calling itself the national convention, elected by the chartists throughout the kingdom, commenced sitting in Birmingham in May, 1839. It proposed to the people various means of coercing the legislature into submission, recommending, among other things, a run on the savings-banks for gold, abstinence from excisable articles, exclusive dealing, and in the last resort, universal cessation from labor. During its sittings, a collision took place with the military in Birmingham. Public meetings were forbidden, and alarming excesses were committed by the irritated mob. In June, 1839, a petition in favor of the charter was presented to the house of commons, signed by 1,280,000 per-

sons. The house refused to name a day for its consideration and the national convention retaliated by advising the people to cease from work throughout the country. Fortunately, this advice was not followed, but the disturbance in the public mind increased, and in Nov., an outbreak at Newport took place, which resulted in the death of 10 persons and the wounding of great numbers. For taking part in this wild insurrection, three of its leaders were sentenced to death, but their punishment was afterwards commuted to transportation. In 1842, great riots took place in the northern and midland districts, not directly caused by the chartists, but encouraged and aided by them after the disturbances began. In the same year, an attempt was made by Joseph Sturge to unite all friends of popular enfranchisement in a complete suffrage union, but he only succeeded in dividing their ranks. In 1848, the turmoil in France created great excitement in England, and much anxiety was felt lest an armed attempt should be made to subvert the institutions of the country. Two hundred thousand special constable swere enrolled in London alone. There were several local outbreaks, and much real danger, but the attempts at disorder were efficiently met, and, as usual, the only result was the punishment of the more prominent men, and the postponement of the desired reforms.

Since 1848, C. has gradually died out. Its principles were not new. The duke of Richmond, in 1780, introduced a bill into the house of lords to give universal suffrage and annual parliaments. In the same year, Charles James Fox declared himself in favor of the identical six points which were afterwards included in the charter. And nearer our own time, earl Grey, Mr. Erskine, sir James Mackintosh, and many others, formed a "society of friends of the people," which aimed at obtaining a very large extension of the suffrage.

The great body of chartists were, however, not so much actuated by the weight of precedent or argument, as impelled by the pressure of actual want, and an indefinite feeling that the laws were somehow to blame for not providing them with the means of comfortable subsistence. But there were many among them who had studied the principles involved in their demands, and maintained them from an intelligent conviction of their truth. These men declared that all persons had an equal natural right to share in determining the laws under which they lived; and further, that as they were required to contribute to the taxation of the country, they were justly entitled to be heard as to the application of the public funds. Taxation and obedience being universal, representation ought to be so. This view being conceded, all the other points of the charter naturally followed, they being merely arrangements for securing the free action of the right contended for. Some of the chartist advocates went far beyond this. There were those among them whose aims included little less than the reorganization of society. One of the ablest advocates of the cause wrote in favor of nationalizing the land, and remodeling the currency; he also proposed a system of state loans for the assistance of laborers who desired to become capitalists, and national marts for the exchange of wealth on terms of equity and justice. Pressed a little further, these views would have developed into communism; but so far as we are aware, most chartists held so strongly the doctrine of *individual* rights, that they were not likely to subordinate *man* to *society*. See COMMUNISM, SOCIALISM. The object aimed at by the majority was merely the extension of the franchise to the masses, in the belief that they would use it wisely and honestly, and put an end to what they considered the selfish and interested rule of classes who had long monopolized the control of the state. The opponents of C. answered, that if the question was argued as one of right, it would go far beyond the conclusions which the chartists had reached. The *right* appertained to women as well as to men, and there was no just reason why sane persons under 21 should be deprived of it. It would also, they maintained, give all power to the most ignorant classes of the community, and thus subject intelligence to brute force. Government existed for the benefit of society, and ought, as far as possible, to depend on the wisdom, and not on the mere number of the people. Then if representation depended upon taxation, it should vary in proportion to the taxes paid. Finally, they denied that men *as such* had a right to vote; their right was to be well governed, and universal suffrage was more likely to destroy society than to confer happiness or insure justice.

The cause which put an end to C. as an organization was undoubtedly the improvement in the circumstances of the people which followed the repeal of the corn laws. Since then, the chief points of the charter have actually become law. A property qualification is no longer necessary in a representative; the reform acts of 1867–68 have virtually established manhood suffrage; and the act of 1872 gave vote by ballot. The efforts of the majority of those who live by manual labor are now directed towards securing, by trades-unions and other means, a larger share than formerly in the profits of industry.

CHARTRES, a city of France, in the department of Eure-et-Loir, 47 m. s.w. of Paris, is built partly at the base and partly on the declivity of a hill overlooking the river Eure, which is here divided into two channels, one flowing within, and the other without the ramparts, which are converted into agreeable promenades. C. consists of an upper and lower town, connected by streets almost inaccessible to carriages. The upper town has some good streets, but the lower is ill built. The houses are old, and many of them composed of wood, with their gables to the street. The cathedral, one of the largest and most imposing ecclesiastical structures in Europe, with its lofty spires, one of them tow-

ering to a height of more than 400 ft., crowns the top of the hill. It has no less than 130 painted-glass windows, the workmanship of which is unsurpassed, if indeed equaled elsewhere in France. The church of St. Pierre, and the obelisk to the memory of gen. Marceau, are also objects of interest. The weekly corn-market of C. is one of the largest in France, and is remarkable as being under a corporation of women, who contrive to get through all the business most satisfactorily in less than an hour. It has manufactures of woolen, hosiery, and leather. Pop. '76, 20,067.

C. is a very ancient city. Under the Roman rule it was called *Autricum*, and remains of Roman antiquity are still found.

CHARTRES, Robert Philippe Louis Eugène Ferdinand d'Orleans, Duc de, b. 1840; the youngest son of the late duke of Orleans, and grandson of Louis Philippe. His father died when he was but two years old, and when he was eight the revolution drove him into exile. He was cared for at Eisenach, in Germany, but soon afterwards joined his family, who were in England. In 1860, he traveled in the east, and in 1861 came to the United States with his elder brother, the count of Paris. Both of them served for a time in the war of the rebellion on gen. McClellan's staff; but they went to England in the summer of 1862. In June, 1863, Robert married his cousin François Marie Amelie d'Orleans, by whom he has five children. After the revolution of Sept., 1870, he returned *incognito* to France, and served in gen. Chanzy's army; and in 1871, after the repeal of the act banishing the Orleans family, he was appointed a maj. in the army and served in Algeria. He has published his travels, and his father's posthumous work on the campaigns of the French army in Africa in 1835 and 1839.

CHARTREUSE, La Grande, a celebrated monastery in France, in the department of Isère, situated 13 m. n.n.e. of Grenoble, in the wild and romantic valley of the Guiers, nearly 4,000 ft. above the sea. It is surrounded by the mountain-forests of the Alps; and the route to it, through a mountain-gorge, down which a rapid river dashes far below the traveler, while above him rise precipitous and foliage-lined rocks, some hundreds of feet in height, is one of the most picturesque. The convent is a huge ungainly structure, dating mostly from the 17th c., earlier buildings having been destroyed several times by fire. The convent owes its origin to St. Bruno, who settled a little higher up the mountain in 1084, giving the name of the place, C., to his order. The monks had at one time considerable property, but they were despoiled at the revolution of 1789.

CHARTULARY (Lat. *chartularia, chartologia*) is, as its name implies, a collection of charters. So soon as any body, ecclesiastical or secular, came to be possessed of a considerable number of charters, obvious considerations of convenience and safety would suggest the advantage of having them classified and copied into a book or roll. Such book or roll has generally received the name of a chartulary. Mabillon traces chartularies in France as far back as the 10th c., and some antiquaries think that chartularies were compiled even still earlier. But it was not until the 12th and 13th centuries that chartularies became common. They were kept not only by all kinds of religious and civil corporations, but even by private families. Many of them have been printed, and their contents generally are of the greatest value in all historical, archæological, and genealogical inquiries.

CHARYBDIS. See Scylla and Charybdis.

CHASCHISH. See Hemp, Indian.

CHASE. When one vessel is pursuing another at sea, the pursued vessel is often called the *chase,* and the pursuer the *chaser.* The maneuver also gives name to certain guns on board ship: a *bow-chaser* being a gun pointing ahead, and a *stern-chaser* pointing astern.

CHASE, in a gun, is the name given to the greater portion of the length between the muzzle and the trunnions.

CHASE, a co. in e. central Kansas, on the Neosho river and its affluents, intersected by the Atchison, Topeka and Santa Fe railroad; 757 sq.m.; pop. '80, 6081. It is an agricultural region. Co. seat, Cottonwood Falls.

CHASE: co. Neb. See page 893.

CHASE, Irah, d.d.; 1793–1864; educated at Middlebury college and Andover theological seminary, and ordained in 1817. He labored for a time as a Baptist missionary in West Virginia, and in 1818 became professor in a theological school in Philadelphia. The school was transferred to Washington, and he remained in his professorship seven years. In 1825, he aided in establishing a theological school at Newton Center, Mass., in which he was a professor for nearly 20 years. In 1830, he assisted in founding the Baptist mission in France. Among his works are *The Life of John Bunyan; The Design of Baptism; The Work Claiming to be the Constitution of the Holy Apostles, revised from the Greek; Infant Baptism an Invention of Man;* and many sermons and essays.

CHASE, Philander, d.d., 1775–1852; graduated at Dartmouth in 1795, and ordained to the ministry of the Episcopal church in 1798. He labored as a missionary in western New York, and in 1811 became rector of Christ church in Hartford, Conn. In 1817, he went to Ohio, where, two years afterward, he was chosen bishop. A few years later he laid the foundation of Kenyon college and Gambier theological seminary. In 1835, he became bishop of Illinois, where he was instrumental in founding Jubilee college, at

Robin's Nest, where he died. Among his works are *A Plea for the West; The Star in the West, or Kenyon College*; *Reminiscences*, etc.

CHASE, Salmon Portland, 1808–73; b. N. H. He was the son of a farmer, and a nephew of bishop Chase, who supervised his earlier education. Graduating from Dartmouth college in 1826, he opened a school for boys at the national capital, and in 1830 was admitted to the bar, where almost his earliest work was the preparation of an edition of the statutes of Ohio with annotations, and a sketch of the history of the state. This assisted him in gaining practice, and in 1834 he was appointed solicitor in Cincinnati for the bank of the United States. His first effort in a cause touching slavery was in defense of a colored woman claimed as a fugitive. He maintained that the fugitive slave law of 1793 was void, because unwarranted by the federal constitution. In the same year he defended James G. Birney (subsequently the candidate of the abolitionists for president), who had been prosecuted under the state law for harboring a slave. In this case he argued that slavery was a local institution, and that as the slave had been brought into a free state by his master, he was in fact free. In 1846, in the Van Zandt case before the U. S. supreme court, he took the ground that under the ordinance of 1787 no fugitive from service could be reclaimed from Ohio unless he had escaped from one of the original states; that it was the understanding of the makers of the constitution that slavery was to be left to the disposal of the several states, without sanction or support from the federal government; and that the clause in the constitution relating to persons held to service was a compact between the states, conferring no power of legislation on congress, and was never intended to confer such power. In 1841, he was prominent in the organization of the liberty party of Ohio, which nominated him for governor. In the national liberty convention at Buffalo in 1843, and in subsequent conventions until the nomination (in 1848) of Martin Van Buren for president, C. was a leading member, and in most cases directed the proceedings. In Feb., 1849, he was chosen U. S. senator from Ohio, his vote coming from all the democrats and a few freesoil members. He acted generally with the democrats until the nomination (in 1852) of Pierce on a strongly pro-slavery platform, when he withdrew and undertook the formation of an independent democratic party. The debate on the Nebraska bill gave him an opportunity to oppose the famous compromise, to which he moved an amendment looking to the exclusion of slavery from all the territories; but it was not adopted. Through all the contest for the repeal of the Missouri compromise and the Kansas debate, he was foremost in opposition to slavery extension. In the mean time, he was heard on other important subjects. He favored internal improvements by the general government, and supported the free homestead movement, and cheap postage. In 1855, he was elected governor of Ohio by the votes of the opponents of the Nebraska bill, and he was re-elected in 1857. His name was before the first national convention of the republican party (1856) for president, but was withdrawn at his own request. He was named, also, in the convention that nominated Lincoln, but was not pressed. In 1861, he was appointed secretary of the treasury, and held the office until July 30, 1864, when he resigned. In this position the arduous duties of sustaining the national credit in the struggle with the rebellion devolved in a great degree upon him; and he proved equal to the occasion. The death of Roger B. Taney in Oct., 1864, made a vacancy in the chair of the chief justice of the U. S. supreme court, which was immediately filled by the appointment of C., in which capacity he presided at the trial on the impeachment of Andrew Johnson in Mar., 1868. About this time, his dissatisfaction with the course of the republican party became so decided as to throw his influence on the side of the democrats, at whose national convention, July, 1868, he was prominently, though unsuccessfully, urged as a presidential candidate. In 1870, he was stricken with paralysis, the effects of which lasted until his death.

CHASE, Samuel, 1741–1811; one of the signers of the declaration of American independence; son of an Episcopal clergyman, and a lawyer in Annapolis, Md. He was one of the earliest and strongest friends of colonial liberty; was a member of the continental congress for four years, and in 1776 went with Charles Carroll and others on the fruitless errand to induce the Canadians to join in the rebellion against English rule. He filled several judicial offices in Maryland, and in 1796 was appointed associate justice of the U. S. supreme court. In 1804, John Randolph brought about his impeachment for misdemeanor in the conduct of political trials, but he was found not guilty on trial by the U. S. senate. He remained on the supreme court bench until his death.

CHASE, William M. See page 893.

CHASIDIM ("Pietists"). This name anciently denoted a whole class of Jewish sects. After the Babylonish captivity, the Jews, with regard to their observance of the law of Moses, were divided into two classes—*Chasidim* and *Zadikim*. When the so-called great synagogue was commissioned by the Persian government to draw up a code of civil and religious laws for the emigrant Jews returning to settle in their native land, several innovations were made on the Mosaic law. Those who accepted these innovations were styled the C.; while those who rejected them were styled, or styled themselves, the Zadikim, or "upright," because they adhered strictly to the law given by Moses, without observing any of the additions made to it. The C. branched forth into several sects, all holding traditions in connection with the written law, which they believed to possess a divine sanction equally with that law. The Pharisees, so often mentioned in the New

Testament, formed an early sect among the C., while from the Zadikim sprang forth the Hellenistic Samaritans, Essenes, Sadducees, etc. Afterwards, the C., or Pharisees, split into Talmudists, Rabbinists, and Cabalists, some of whom underwent still further subdivision.—The modern C. are not, like those in the times of the Maccabees, marked by any peculiar spiritualistic tendency in religion, but rather by a strict observance of certain traditional forms, and a blind subservience to their teachers. Their doctrine was promulgated in the middle of the 18th c. by Israel of Podolia, called *Baal-Shem* ("lord of the name," so called because he professed to perform miracles by using the great cabalistic name of the supreme being). Though condemned by the orthodox rabbis, this new teacher had great success in Galicia, and when he died (1760) left 40,000 converts. They are now broken into several petty sects; their religion is utterly formal, and its ceremonies are coarse and noisy.

CHASING, the art of working raised or half-raised figures in gold, silver, bronze, or other metal. It was called *cælatura* by the Romans; and the term is expressly limited by Quintilian to working in metal. The same art when exercised on wood, ivory, marble, precious stones, or glass, was called *sculptura.* See CARVING. Iron was sometimes, though rarely used, silver having been always the favorite metal for this purpose. Closely connected with, but still distinguished from C., is the art of stamping with the punch, which the Romans designated by *excudere.* The Greek *toreutike* is usually supposed to correspond to C., but the point is by no means free from dispute. The art was known at a very early period, as may be inferred from the shield of Achilles, the ark of Cypselus, and other productions of the kind. Such portions of the colossal statues made by Phidias and Polycletus, as were not of ivory, were produced by the toreutic art. The statue of Minerva was richly adorned in this manner. Besides Phidias and Polycletus, Myron, Mys, and Mentor were celebrated toreutic artists in antiquity, and amongst many moderns the most famous is Benvenuto Cellini (q.v.).

CHASLES, MICHEL, b. 1793; a French mathematician, educated at the Paris polytechnic school. In 1841, he was appointed professor of geometry in that institution. Among numerous essays and books of his productions are: *Historical Views of the Origin and Development of Methods in Geometry; History of Arithmetic;* and *Treatise on Superior Geometry.* In 1851, he became a member of the academy, and in 1867, he reported to that body that he was in possession of 27,000 letters and documents of great antiquity and value, among them letters and papers believed to have been written by Dante, Petrarch, Rabelais, Julius Cæsar, Shakespeare, and other persons of renown. Only about 100 of these were genuine, though they completely imposed upon C. and other good judges. The forger, Irene Lucas, was imprisoned two years for forgery and fraud. C. d. 1880.

CHASLES, VICTOR EUPHÉMION PHILARÈTE, 1798–1873; a French writer who traveled in the United States about 1820–23. In 1837, he was director of the Mazarin library, and in 1841, professor of German language and literature in the college of France. He published in 20 vols. *Comparative Studies of Literature;* wrote tales and books of travel; and prepared editions of classic authors.

CHASSE, music composed in imitation of the chase, and performed chiefly by horns, occasionally combined with other wind instruments. Its movement is in $\frac{6}{8}$ time. The best specimens of this kind of music are an overture by Mehul, and a C. for the pianoforte by Kreutzer.

CHASSÉ, DAVID HENDRIK, Baron, was b. in Tiel, Mar. 18, 1765, began his military career when but ten years of age, became a lieut. in 1781, and capt. in 1787. After the revolution of that year, C., as siding with the humbled Dutch patriots, took French service; was appointed lieut.col. in 1793; and, two years later, found himself marching towards the Netherlands under the command of Pichegru. He afterwards fought with the French in Germany and Spain, gaining great distinction and the appellation of *Général Bayonnette.* As lieut.gen. of the Dutch forces in 1815, C. added to his laurels on the field of Waterloo. After the peace he was made governor of Antwerp in 1830, and bravely defended it against the united Belgians and French from Nov. 29 till Dec. 23, 1832, when he was forced to surrender. He died in May, 1849.

CHASSELOUP-LAUBAT, FRANÇOIS DE, Marquis, 1754–1833; a French military engineer who conducted the works at Maestricht in 1794, at Mentz in 1795, and in the Italian campaigns up to 1812; when he was appointed senator. Louis XVIII. made him a marquis.

CHASSELOUP-LAUBAT, JUSTIN NAPOLÉON SAMUEL PROSPER DE, Marquis, 1805–73; in 1837, a member of the French chamber of deputies and afterwards councilor of state. In 1849, he was again a member, and then and afterwards a supporter of Louis Napoleon, who made him minister of marine. He was for some years the president of the colonial board of Algeria. In 1869, he presided over the council of state until the accession of Ollivier's administration

CHASSEPOT, a breech-loading rifle invented by Antoine Alphonse Chassepot, b. Mar, 4, 1833; he was attached, in 1858, to the government workshops of St. Thomas at Paris, of which he was made director in 1864; and was afterwards officially attached to the national manufactory of arms at Chatellerault, near Poitiers. He took out patents

for his invention, and the royalty has brought him a large income. He was decorated with the cross of the legion of honor in 1866. The first model of the C. was exhibited in 1863; but it was not introduced in the French army till after the Prussians had proved the efficiency of the needle-gun in the war of 1866 against Austria; it was used successfully in the Franco-German war of 1870. The C. is an improved needle-gun; the fulminate is in a paper wad which forms the rear of the cartridge envelope; the gas check is a cylindrical ring of vulcanized India rubber, which is pressed against the surface of the chamber when the explosion takes place; the cartridge envelope is of silk or linen, with a caliber of .433 inch. The gun has 4 grooves, and can be fired 12 times a minute at a range of 1200 yards. An improved form of the C. has been recently introduced in France, in which the metallic cartridge can be used.

CHASSEURS (Fr., hunters) is a name used for two important forces in the French army. The mounted C. (*chasseurs-à-cheval*) are a body of light cavalry, designed for service in advance or on the flanks of the army, and correspond most nearly to the light horse of the British service. The name is first used in this sense in 1741, and has been retained while the force it denotes has undergone many alterations in organization and equipment. In 1831, a body of cavalry was raised for service in Africa, mounted on Arab horses, and with a distinct uniform. These have since become famous as the *C. d'Afrique*. After the reorganization of the French army in 1873, the effective army contained 14 regiments (subsequently increased to 20) of chasseur-à-cheval, besides 4 regiments of C. d'Afrique.—The infantry C. (*chasseurs-à-pied*) are a light infantry force in many respects corresponding with the cavalry C., and like them intended for detached service (like the rifle corps in the English army). The French are believed to have adopted the idea of such a force of sharpshooters from the *Jäger* (the German word corresponding to C. or *hunters*) in the German armies. First used in the thirty years' war, the Jäger derived their name from the fact that they were chiefly drafted from amongst mountaineers and inhabitants of forest regions. They have always been regarded as a valuable contingent in the Prussian and Austrian armies, or even constitute the entire force of light infantry. In the German army, there are 26 battalions (near 15,000 men) of this force; in the Austrian service, upwards of 20,000 officers and men. In France, the equipment of the C. differed little from that of the other infantry; it was not until the formation, in 1838, of the *C. de Vincennes*, that the experiment of a specially armed force of sharpshooters was fairly tried. The fame of the C. de Vincennes for rapidity and precision of movement, as well as for the accuracy of their fire, soon vindicated the importance of this branch of the infantry; and at present there are 30 battalions of chasseurs-à-pied in the French army.

CHASTELAIN, Georges, 1403–75; in the service of Philip the good of Burgundy, at whose request he compiled the *Grande Chronique*, or history. Of their work, which was to have filled six volumes, only two fragments of importance are known to exist—the first extending from 1419 to 1422; the second, with large breaks in the text, from 1461 to 1474.

CHASTELARD, Pierre Boscobel de, 1540–63; a French poet, a scion of the house of Bayard. The name of Chastelard is romantically connected with that of Mary queen of Scots. He was a page in the house of marshal Danville, whom he accompanied in his journey to Scotland as escort of Mary in 1561. C. returned to Paris in the marshal's train, but left almost immediately for Scotland bearing letters of recommendation to Mary from Montmorency, and also the "regrets" addressed to the queen by Pierre Ronsard. C.'s master in the art of song. The enthusiastic page fell in love with the queen, who is said to have encouraged his passion. Copies of verses passed between them, and she lost no occasion of showing herself partial to his person and conversation. The young man hid under her bed, where he was found by the maids of honor; but Mary pardoned the offense, and the old familiarity between them was resumed. Again C. was so rash as to violate her privacy; but he was discovered, seized, sentenced, and hanged the next morning. He met his fate consistently, reading, on his way to the scaffold, Ronsard's "Hymn to Death;" and turning at the moment of doom towards Holyrood, addressing to his unseen mistress the famous farewell: "Adieu! thou so fair and so cruel; thou killest me, and yet I cannot cease to love thee!" Another story is that he simply ejaculated "Cruel queen!" emphasizing the words by a threatening gesture.

CHASTELER, Jean Gabriel Joseph Albert, Marquis de, 1763–1825. He was in the Austrian service as a general officer, and served in the war of the Bavarian succession, and in the war against the Turks. He defended Namur against the French, participated in the third partition of Poland, and was sent to Russia to engage the emperor Paul in a coalition against France. In 1799, he was in the Russo-Austrian army, and was seriously wounded before Tolona, Italy. He fought in the Tyrol against Napoleon, but was beaten by Lefebre, May 13, 1809, and was compelled to fly to Hungary. When the Lombardo-Venetian kingdom was established, he was made governor of Venice.

CHASTELLUX, François Jean, Marquis de, 1734–88; a French soldier and author, distinguished in the seven years' war in Germany, and in the army of Rochambeau in

the American revolution, where he held the rank of maj.gen. His chief works are *De la Félicité Publique; Voyages in North America;* and a *Discourse on the Advantages Resulting to Europe from the Discovery of America.*

CHASTE-TREE. See VITEX.

CHASUBLE (Lat. *casula*, *casubula*, and *cassibula*), the uppermost garment worn by priests in the Roman Catholic church, when robed for the celebration of the mass. It was called also "the vestment," and under that name seems occasionally to have been used in the English church after the reformation. Originally it covered the priest from head to foot, like a little house, whence some writers think it had its name of *casula*. In more recent times, at least, it was made of velvet. It was of an elliptical shape, like a *vesica piscis*, with a hole in the middle for the head; it had no sleeves. When put on, it showed two peaks, one hanging down before; another, on which a cross was embroidered, hanging down behind. According to Hildebert, the C. signified good works; according to Alcuin, charity; according to another writer, the unity of the faith. Durand makes one peak the symbol of love to God, the other peak the symbol of love to our neighbor. In France, the press or wardrobe in which chasubles were kept was called the *chasublier*.

CHAT, *Saxïcola*, a genus of small birds of the very numerous family *sylviadæ* (q.v.), distinguished by a bill slightly depressed, and widened at the base. They have rather longer legs than most of the family. They are lively birds, flitting about with incessant and rapid motion in pursuit of the insects on which they chiefly feed. They are found in Europe, Asia, Africa, and New Holland. Three species are British—the stonechat, whinchat, and wheatear.—The yellow-breasted C. of the United States (*icteria polyglotta*) is a larger bird, and belongs to the family *turdidæ* or *merulidæ*.

CHATARD, FRANCIS SILAS, D.D. See page 894.

CHÂTEAU, CHÂTEL, or CASTEL, from the Lat. *castellum*, a fort, enters as a component part into many names of places in France.

CHATEAUBRIAND, FRANÇOIS AUGUSTE, Viscomte de, one of the most distinguished of French authors, was b. Sept. 4, 1769, at St. Malo, in Bretagne, and received his early education in the college at Rennes. While traveling in North America in 1790, he accidentally read in an English newspaper the account of the flight and arrest of Louis XVI. He immediately returned to France, intending to fight against the republic; but being seriously wounded at the siege of Thionville, in Sept., 1792, he escaped to England, where he lived in such poverty that he was compelled to make translations for the book-sellers, and to give lessons in French. In 1797, he published his first political essay, *Sur les Révolutions Anciennes et Modernes, considérées dans leurs Rapports avec la Révolution Française* (2 vols., London), a republican and sceptical work, the outcome of hardship, poverty, and sorrow. His skepticism soon vanished, but republican impulses continued to flash out at intervals during the whole of his strangely-checkered, inexplicable, and inconsistent career. In 1800, C. returned to Paris, and wrote for the *Mercure de France.* In this journal, he first printed his tale of *Atala* (1801), with a preface lauding the first consul, Bonaparte. Its success was remarkable, but nothing to the miraculous enthusiasm excited by his *Génie du Christianisme* (1802), a work exactly suited to the jaded skepticism of the age, and also in accordance with the policy of the first consul, who was then concluding the concordat with the pope, and wished to make the Roman Catholic priesthood subservient to his measures. Bonaparte, therefore, appointed C. secretary to the embassy in Rome, and, in 1803, sent him as ambassador to the little republic of Valais. On the execution of the duke d'Enghien, Mar. 21, 1804, C. resigned in disgust. In 1806, he commenced his pilgrimage to the Holy Land, visited Greece, Palestine, Alexandria, and Carthage, and returned through Spain to France in May, 1807. From this period to the fall of Napoleon, he lived privately, publishing only two works of any value—*Les Martyrs* and the *Itinéraire de Paris à Jérusalem.* In 1814, his eloquent brochure, *De Bonaparte et des Bourbons*, excited such attention, that Louis XVIII. declared it was worth an army of 100,000 men in favor of legitimacy.

After the battle of Waterloo, C. returned to Paris, where he was made peer and minister of state. Gradually his monarchical zeal subsided, and, in his address, *De la Monarchie selon la Charte*, delivered in the chamber of peers, he gave expression to such liberal tendencies as offended the king, who erased his name from the list of his counselors. Soon, however, he appeared again as an ultraroyalist; and at the baptism of the infant duke de Bordeaux, C. presented to the duchess of Berry a flask filled with water from the Jordan. In 1822, he was appointed ambassador-extraordinary to the British court, but was rather rudely dismissed from office in 1824.

In 1826, C. prepared the first edition of his collected works, for the copyright of which the publisher gave the large sum of 600,000 francs, of which C. returned 100,000. During the days of July, 1830, he was staying with his friend Mme. Récamier at Dieppe; but as soon as he heard tidings of the revolution, he hastened to Paris. He refused to take the oath of fealty to Louis Philippe. This political crotchetiness, which always rendered it impossible to know beforehand what course of conduct C. would adopt, is perhaps best explained by the following passage from his *De la Restauration et de la Monarchie Elective* (Paris, 1831): "I am a Bourbonist in honor, a monarchist on

grounds of rational conviction; but in natural character and disposition, I am still a republican." In 1832, he revised a new edition of his works, and, after visiting the court of the expelled Bourbons, devoted his attention to the preparation of his memoirs, intended to be published posthumously (*Mémoires d'outre Tombe*), though considerable extracts were printed during his lifetime. He also found leisure to write several other works. He died July 4, 1848.

C. wrote with warmth, energy, and a rich supply of imagery. Many of his descriptive passages are excellent, but his ideas want depth and coherency.—Marin, *Histoire de la Vie et des Ouvrages de M. de Chateaubriand* (2 vols., Paris, 1832).

CHÂTEAUDUN, a t. of France, in the department of Eure-et-Loir, is situated on the Loir, a tributary of the Loire, about 26 m. s.s.w. of Chartres. The streets are straight and well built, and an old castle, with an enormous tower, overlooks the town. C. has manufactures of blankets and leather. Pop. '76, 6,061.

CHÂTEAUGAY, a s.w. co. in the province of Quebec, Canada, on the St. Lawrence, drained by the Chateaugay, the Noire, and other rivers; 250 sq.m.; pop. '81, 14,393. It is generally level, and the soil is fertile. Chief town, St. Martine.

CHÂTEAU-GONTIER, a t. of France, in the department of Mayenne, situated on the river of that name, here crossed by a stone bridge, 18 m. s.s.e. of Laval. C. has some good houses, but the streets are not well laid out. It has linen and woolen manufactures. Pop. '76, 7,218.

CHÂTEAUGUAY, Sieur de. See Le Moyne.

CHÂTEAUNEUF DE RANDON, a village of France, in the department of Lozère, 12 m. n.e. of Mende. A pretty historical incident connected with the place, which was formerly fortified, makes it interesting. In 1380, the fortress, then held by the English, was besieged by the troops of Charles V., under the command of the gallant Du Guesclin. The English governor, sore pressed, promised to yield in fifteen days if no succor arrived. In the meantime, Du Guesclin died, and his successor was appointed, who, at the expiry of the fifteen days, summoned the governor to surrender. He refused to yield up the keys to any but Du Guesclin; and when informed of his death, marched out, and on bended knee laid the keys and his sword on the dead hero's bier. Pop. '72, 393.

CHÂTEAUROUX, a t. of France in the department of Indre, situated on a rising ground in the midst of an extensive plain, on the left bank of the river Indre, 166 m. s. of Paris by railway. The town, which was formerly dirty and ill built, has been greatly improved within the last quarter of a century. C. does not possess much interest for the traveler. It is a busy place, with extensive woolen factories, besides manufactures of cotton, hosiery, yarn, hats, paper, parchment, hardware, leather, etc. Some of the best iron in France is found in the vicinity. The town owes its origin to a castle built here in the 10th century. Pop. '76, 16,980.

CHÂTEAU-THIERRY, a t. in the department of Aisne, France, on the right bank of the Marne; pop. '72, 5,347. It has a commercial college, a public library, and manufactories of linen, cotton, leather, and earthenware. There is a marble statue of La Fontaine, the fabulist. The town takes its name from a castle said to have been built by Charles Martel for Thierry IV., the ruins of which are on an adjacent hill. The position of Château-Thierry has subjected it to many disasters. It was captured by the English in 1421, by Charles V. in 1545, by the Spanish in 1591; pillaged in the Fronde wars in 1652, and suffered severely in the Napoleonic campaign of 1814.

CHÂTEL, Ferdinand Toussaint François, Abbé, 1795–1857; ordained as a priest in 1818, serving as vicar to several French towns, and as chaplain in the army. In 1831, he founded a new sect in whose doctrines Christ was to be venerated only as a perfectly good man, and the confessional, fasting, and vows of chastity and celibacy were to be omitted. The authorities interfered in 1842 and closed his place of worship, but in 1848 he appeared again as an especial champion of women's rights. His public meetings were suppressed in 1850, and he passed his later years in the duties of a metropolitan postmaster.

CHÂTELET, the name of two old fortresses of Paris, believed by some to have been built in the time of Julius Cæsar. The grand C. was restored by Louis IX. and remodeled by other kings. It was demolished in 1802. It was the residence of counts of Paris, and became an important seat of the judiciary, as well as a prison. This fortress stood on the right bank of the Seine where is how the w. part of the place de Châtelet. The petit C. was on the other bank near the present place du Petit Pont. It was demolished in 1782. In earlier times it was one of the gates of the city.

CHÂTELET-LOMONT, Gabrielle Emilie, Marquise du, a very learned French woman, notorious for her intimacy with Voltaire, was born at Paris, 17th Dec., 1706. At an early period she displayed a great aptitude for the acquisition of knowledge. She studied Latin and Italian with her father, the baron de Breteuil, and subsequently betook herself with zeal to mathematics and the physical sciences. Distinguished alike for her beauty and talent, she soon found a host of suitors for her hand. Her choice fell on the marquis du Châtelet-Lomont, but her marriage did not hinder her from forming a *tendresse*

for Voltaire, who came to reside with her at Cirey, a château on the borders of Champagne and Lorraine, belonging to her husband. Here they studied, loved, quarreled, and loved again, for several years. In 1747, however, poor Madame C. became "not insensible to the brilliant qualities" of a certain M. Saint-Lambert, a capt. of the Lorraine guards; and the result was, that the philosopher had to make room for the soldier, and content himself for the future with being the "devoted and indulgent friend" of his former mistress. This new intimacy became fatal to Madame Châtelet. She died at Luneville, 10th Sept., 1749, a few days after having given birth to a child. Her first writing was a treatise on the philosophy of Leibnitz. She also translated the *Principia* of Newton into French, accompanying it with algebraic elucidations. It did not, however, appear till 1756, some years after her death. Her correspondence with Voltaire is interesting; but the fact that a woman so highly gifted as Madame C., and possessing so many amiable qualities, should never have dreamed that there was anything wrong in her *liaisons*, proves with terrible conclusiveness how corrupt was that philosophic society which, in the 18th c., professed to explode superstition and enlighten France and the world.

CHÂTELLERAULT, a t. of France, in the department of Vienne, situated on the river of that name, 18 m. n.n.e. of Poitiers. A handsome stone bridge, with a massive castellated gateway, built by Sully, at one end, connects it with a suburb on the other side of the river. C., which is an ill-built, mean-looking town, is one of the chief seats of the manufacture of cutlery in France, and since 1820 has had a national manufactory of swords and bayonets. Its river-port makes it the entrepôt for the produce of an extensive district. The duke of Hamilton derives his title of duke of Châtelherault from this place. Pop. '76, 15,244.

CHATHAM, a co. in s.e. Georgia, on the ocean and the South Carolina border; 358 sq.m.; pop. '80, 44,995—27,535 colored. It is level and swampy, with fertile soil near the rivers. Rice, sweet potatoes, corn, and cotton are the chief productions. The Savannah, Alabama, and Gulf railroad intersects it. Co. seat, Savannah.

CHATHAM, a co. in central North Carolina, reached by the Chatham railroad, and drained by the Rocky, New Hope, Deep, and Haw rivers; 700 sq.m.; pop. '80, 23,456—7955 colored. Chief productions, wheat, corn, oats, tobacco, butter, and coal. Co. seat, Pittsboro.

CHATHAM, N. J. See page 894.

CHATHAM, a t. in Barnstable co., Mass., on the s.e. extremity of cape Cod, near the Cape Cod railroad; pop. '80, 2252. Fishing is the business of the greater portion of the inhabitants. There are three important lighthouses in the township.

CHATHAM (Saxon, *Ceteham* or *Cættham*, understood to signify the "village of cottages"), a parliamentary borough, river-port, fortified town, and naval arsenal, in the co. of Kent, situated on the right bank of the Medway, at the upper part of its estuary, 30 m. e.s.e. of London. Much of C. is ill built and irregular. The High street is 1¼ m. long, parallel to the river, and swarms with soldiers and Jews. The refuse timber of the dock-yard is much used in building the house-walls. C. owes its importance to its naval and military establishments situated at Brompton village (on a height half a mile n. of C.), and on the Medway estuary. The C. fortified lines are the frequent scenes of field-operations, imitation battles, and grand reviews. Pop. '81, 46,806. The borough, which sends one member to parliament, is governed by a head-constable under the magistrates of Rochester. The Romans seem to have once had a cemetery here. Traces of Roman villas have been found, with Roman bricks, tiles, coins, and weapons. The dock-yard was founded by Elizabeth before the threatened invasion of the Spanish Armada. In 1662, it was removed to its present site. In 1667, the Dutch, under De Ruyter, sailed up the estuary of the Medway, and, in spite of the fire from the castle, destroyed much shipping and stores.

In a military point of view, the lines of detached forts connected with C. constitute a fortification of greath strength; and the whole is regarded as a flank defense for London in the event of an invader seeking to march on the capital from the s. coast. The place is also defended by some strong forts on the Medway. In and near C. are fort Pitt, a military hospital and strong fort; barracks for infantry, marines, artillery, and engineers; a park of artillery; and magazines, store-houses, and dépots on a large scale.

In a naval sense, C. is one of the principal royal ship-building establishments in the kingdom, and a visit to it never fails to impress the stranger with a sense of the naval power of England. The dock-yard is nearly 2 m. in length, containing several building-slips, and wet docks sufficiently capacious for the largest ships; and the whole is traversed in every direction by a tramway for locomotives, with a gauge of 18 inches. One peculiar establishment in this dock-yard is a metal mill, which supplies all the royal dock-yards with copper sheets, copper bolts, and other articles in copper and mixed metal. The saw-mills at C. are so extensive that it is said that, if fully employed, they could cup up timber enough for all the dock-yards. A duplicate of Brunel's block-making machinery is kept at C., ready to supplement the operations of that at Portsmouth. The dock-yard is under the control of a captain-superintendent and other officers, whose annual salaries vary from £700 to £200 each. Under them are clerks

receiving from £450 to £80 each. The actual workmen, artisans, and laborers, vary in number according to the amount of ship-building and repairing going on. In the navy estimates provision is made for about 3,500 shipwrights, calkers, joiners, sawyers, millwrights, smiths, blockmakers, sailmakers, ropemakers, riggers, laborers, etc. The total outlay on the C. establishment in 1879–80 was £685,253.

CHATHAM, a t. in Northumberland co., N. B., on the Miramichi river, near its entrance into Miramichi bay; pop. '81, 5,762. It has a Roman Catholic cathedral, a college, and a temperance hall. It is a port of entry, and has a large export trade in fish, lumber, etc.

CHATHAM, a t. in Kent co., Ontario province, Canada, on the Thomas river, 47 m. e. of Detroit, Mich.; reached by the Great Western railroad, and by steamboats from the lakes. It is in a rich agricultural district, and has a large trade in grain and lumber. Pop. '81, 7,873.

CHATHAM, Va. See page 894.

CHATHAM, William Pitt, Earl of, sometimes styled Pitt the Elder, one of the greatest English orators and statesmen of the 18th c., was the son of a country gentleman, Robert Pitt of Boconnoc, in Cornwall; and was b. Nov. 15, 1708. After an education at Eton and Oxford, he traveled on the continent, and on his return obtained a cornetcy in the blues. In 1735, he entered parliament for Old Sarum—that synonym for electoral corruption—a borough then belonging to his family. He espoused the side of Frederick prince of Wales, then at deadly feud with the king, and offered a determined opposition to Walpole, who was at the head of affairs. He was deprived of his commission in consequence—an insult and injury which only increased the vehemence of his denunciations of the court and the government. His influence, both in and out of the house of commons, increased rapidly; and Walpole, being driven from power, the king, notwithstanding his hatred of Pitt, found it necessary to allow of his admission to a subordinate place in the broad bottom administration; subsequently he was appointed to the lucrative office of paymaster-general. The duchess of Marlborough, pleased with his patriotism and powers of oratory, left him £10,000; and later, sir William Pynsent, struck with similar admiration, left him his whole property. In 1755, when Henry Fox (afterwards lord Holland) was made secretary of state, finding himself opposed to the foreign policy of the new minister, Pitt resigned office as paymaster. In the following year, when the king, unwillingly acceding to popular demands, had to dismiss Fox, Pitt became nominally secretary of state, but was virtually premier. He immediately began to put into execution his own plan of carrying on the war with France. He raised the militia, and strengthened the naval power; but the king's old enmity, and German predilections, led him to oppose Pitt's policy, who thereupon resigned office in April, 1757, but was recalled in June, in obedience to the loud demands of the people.

Now firmly established in power, Pitt's war policy was characterized by unusual vigor and sagacity. Success returned to the British arms. French armies were beaten everywhere by Britain and her allies—in India, in Africa, in Canada, on the Rhine—and British fleets drove the few French ships they did not capture or destroy from almost every sea. But the prime mover of all these brilliant victories found himself compelled to resign (1761), when, on the accession of George III., and owing to the influence of lord Bute, it was attempted to introduce a vacillating policy into the government; his immediate cause of resignation being the refusal of the majority of the cabinet to declare war with Spain, which Pitt, foreseeing as imminent, wished to commence before the Spaniards were thoroughly prepared. As some recompense for his important services, Pitt received a pension of £3,000 a year; and his wife, sister of George Grenville, was created baroness Chatham. Until 1766, Pitt remained out of office, not offering a factious opposition to government, but employing all his eloquence to defeat some of its most obnoxious measures. In that year he received the royal commands to form a ministry. He undertook the task, choosing for himself—to the astonishment of the public, and the sacrifice, to a considerable extent, of his popularity—the almost sinecure office of privy seal, with a seat in the house of lords as viscount Pitt and earl of Chatham. Ill-health prevented C. from taking any active part in this ministry, of which he was nominally the head, and which was weak and embarrassed throughout, and he resigned in 1768, to hold office no more. He did not, however, cease to take an interest in public affairs. He spoke strongly against the arbitrary and harsh policy of government towards the American colonies, and warmly urged an amicable settlement of the differences. But when, America having entered into treaty with France, it was proposed by the duke of Richmond to remove the ministers, and make peace on any terms, C., though much debilitated, came down to the house of lords, and in a powerful address protested against the implied prostration of Britain before the throne of the Bourbons, and declared war, with whatever issue, preferable to the proposed terms of peace. This address secured a majority against the motion, and the war was continued. But it was the orator's last effort; for, exhausted by speaking, on rising again to reply to a query addressed to him by the duke of Richmond, his physical powers suddenly failed, he fell back into the arms of his friends, and was carried from the house. He died May 11, 1778. He was honored with a public funeral in Westminster abbey, where a statue was also erected to his memory at the public expense; and, in addition, government voted

£20,000 to pay his debts, and conferred a pension of £4,000 a year on his descendants. C.'s personal appearance was dignified and imposing, and added greatly to the attractions of his oratory, which was of the most powerful kind. His upright and irreproachable character demanded the admiration of his enemies; but his affectedness and haughtiness not unfrequently disgusted his friends, and pride rather than principle seems to have actuated his course at some important conjunctures of his life. He had, however, an intense love of country; the grand object of his ambition being to make his native land safe against all contingencies, and powerful among nations.

CHATHAM ISLANDS, a small group in the Pacific, lying about 400 m. due e. of the Canterbury settlement, on the Middle island of New Zealand, in lat. 43° 38′ to 44° 40′ s., long. 177° to 179′ w., being thus almost precisely the antipodes of Toulouse, in France. They were discovered in 1791 by lieut. Broughton, both the cluster and its chief member taking the name of his ship. Chatham island is computed to contain 600,000 acres; a salt or brackish lake, however, of 20 m. in length, occupying the interior. The soil and climate of the archipelago, in general, are said to be good. Wheat yields abundantly; and the horses, cattle, and pigs which have been introduced thrive well. Timber of any size is unknown, so that the native canoe, instead of being cut out of a single tree, is merely wicker-work bound together by cordage of indigenous flax. The aborigines have two missions among them—one from Germany, and the other from New Zealand.

CHATI, a cat, *felis mitis*, smaller than the ocelot, and something like the leopard, a native of South America. It greatly annoys farmers by destroying fowls, birds, and smaller animals. Like all of the cat kind, it hunts mostly in the dark.

CHÂTILLON, a t. of France in the department of Cote d'Or, on the Seine, about 45 m. n.n.w. of Dijon. Pop. '76, 4,894. C. is chiefly famous on account of the congress of allied sovereigns held here in 1814, from Feb. 5 to Mar. 19, for the purpose of negotiation with Napoleon respecting conditions of peace. Several of the conditions proposed by the allies Napoleon could not bring himself to submit to, and the negotiations broke up, Mar. 19. On the 25th, when their armies were, in fact, marching on Paris, the allies from Vitry issued their declaration justifying a continuation of the war.

CHAT MOSS, a bog in Lancashire, the largest in England, about 7,000 acres in extent, and celebrated as having been the scene of the first great and successful efforts for the reclaiming of bogs, by Mr. Roscoe of Liverpool, in the end of the 18th and beginning of the 19th c., and of one of the great engineering triumphs of George Stephenson in the construction of the Liverpool and Manchester railway. It is situated between Liverpool and Manchester, at no great elevation above the sea. It is from 20 to 30 ft. in depth, and of such consistence that when an attempt was first made to survey it for the Liverpool and Manchester railway, the attempt was relinquished because of the impossibility of obtaining a sufficiently solid stand for the theodolite. Drains are filled up almost as fast as they are cut, by a pulpy stuff flowing into them, and affect only a few feet on either side. Great danger is experienced by any person stepping unwarily on the surface of the bog: and when he begins to sink, his struggles to extricate himself only cause him to sink faster and deeper. Mr. Roscoe's agricultural improvements were effected by numerous parallel drains in the parts on which he operated. The use of *pattens* by his workmen, and the adaptation of them to the feet of the horses employed, have been mentioned in the article Bog. The enlargement of the circle upon which a horse's foot rests from 5 in. diameter to 7, nearly doubles it, and consequently diminishes nearly by one half the pressure on each unit of surface. Mr. Stephenson, when he could find no one to countenance him in his views, calculated with confidence on the application of this principle to the railway, so that even the ponderous locomotive and train might be supported by a sufficient extension of the bearing surface; and this he accomplished by spreading branches of trees and hedge-cuttings, and in the softest places rude hurdles interwoven with heather, on the natural surface of the ground, containing interwined roots of heather and long grass; a thin layer of gravel being spread above all, on which the sleepers, chairs, and rails were laid in the usual manner. Drains were at the same time cut on both sides of the line, and in the central part of the moss a conduit was formed beneath the line of railway, of old tar-barrels placed end to end. Notwithstanding difficulties which every one but himself deemed insuperable, Mr. Stephenson constructed the portion of the line through C. M. at a smaller expense than any other part of the railway. There still is "a sort of springiness in the road over the moss, such as is felt when passing along a suspension-bridge;" and "those who looked along the moss as a train passed over it, said they could observe a waviness, such as precedes and follows a skater upon ice."

The complete reclaiming of C. M. for agricultural purposes can be only a question of time and expense. It seems capable of becoming one of the most productive tracts of land in England.

CHATOYANT, a term to denote the changeable internal light seen in some minerals, such as "cat's eye." (See Cat's Eye, *ante*.)

CHÂTRE, La., a t. in the department of Indre, France, on the river Indre, 20 m. s.e. of Chateauroux; pop. '66, 5,167. There is a ruined castle, one of the towers of which is still used as a prison.

CHATSK, or SCHAZK, a t. of European Russia, government of Tambov, 175 m. s.e. of Moscow, on a small river of the same name. It is situated in the midst of a vast fertile plain, contains a number of churches, and has a trade in hardware, grain, and cattle. Pop. '67, 6,783.

CHATSWORTH, the magnificent mansion of the duke of Devonshire, and one of the most splendid private seats in England, is situated in Derbyshire on the Derwent, 12 m. n. by w. of Matlock. William the conqueror gave the domain to his natural son William Peveril. It was purchased by sir W. Cavendish in queen Elizabeth's time. Sir W., in 1570, began the old mansion, which was finished by his widow, afterwards countess of Shrewsbury. In this building Mary Queen of Scots was imprisoned for 13 years. The present edifice, called a palace from its grandeur, includes the old Ionic pile, 183 by 172 ft. built 1687–1706, by the first duke of Devonshire, after designs by Talman and Wren. The great stables were built about 1706, and the n. wing since 1720. The façade is 720 ft. long, or with the terraces, 1200 feet. The building is nearly a square, with an interior court. C. is famed for its pictures, sculptures, hangings, carvings, and bass-reliefs. There are some exquisite sculptures by Canova, Thorwaldsen, Chantrey, etc. The grounds around are 9 m. in circuit, including hill and dale, and fine prospects. They were laid out by Loudon and Paxton, and are celebrated for their trees, shrubs, rock-work, deer, and water-works—only surpassed by those at Versailles. The conservatory, unrivaled in Europe, covers nearly an acre, measures 300 by 145 ft., and 65 ft. high, has 70,000 sq. ft. of glass, and a carriage-road through it. Hobbes, the philosopher, lived long at Chatsworth.

CHATTAHOO'CHEE, a river of the United States, rises on the eastern declivity of the Blue Ridge of the Alleghanies, in the n. of Georgia; traverses that state in a s.w. direction; becomes the boundary between it and Alabama; and finally, after receiving the Flint from the left, crosses Florida, under the name of Appalachicola, into the gulf of Mexico. With an entire course of 550 m., it is navigable upwards as far as Columbus, at a distance of 350 m. from the sea. It forms the principal outlet for the cotton crops of its basin.

CHATTAHOO'CHEE, a co. in s.w. Georgia, on the Alabama border; 250 sq.m.; pop. '80, 5670—3546 colored. Agriculture is the chief business. Co. seat, Cusseta.

CHATTANOOGA, a city in Hamilton co., Tenn., on the Tennessee river, near the Alabama boundary; pop. '83, 20,000—7,000 colored. The river is navigable for steamboats about eight months in the year, and by light-draught boats at all times. Four railroads center at Chattanooga, and afford easy communication in all directions. The city is one of the most important shipping points in that section of the country. The region is rich in coal and iron, and there is abundance of water-power. At this point, in Oct., 1863, occurred one of the most important conflicts of the war of the rebellion. After the retreat of Rosecrans from the field of Chickamauga, in Sept., the confederates under Bragg sent a cavalry force across the Tennessee above Chattanooga, and seized several points on the railroad in order to cut off his supplies. Shortly afterwards, Grant relieved Rosecrans and assumed command of the department of the Tennessee, Cumberland, and Ohio. Thomas was appointed commander of the department of the Cumberland, Sherman was assigned to the department of the Tennessee, and Hooker, with the 11th and 12th corps, which had been transferred from the army of the Potomac, was sent across the river to make a flank movement against Bragg, while a force under William F. Smith was thrown across the river at Brown's ferry, below Chattanooga, to seize the points of Lookout mountain that commanded the passage of the river. These measures, which were executed Oct. 27, 28, and 29, were successful in restoring the connection between the union army at Chattanooga and its depot of supplies. Sherman's army having arrived, the movement against the confederates was begun Nov. 23. Thomas's troops attacked and carried the enemy's first line of rifle-pits at 2 P.M., and held it during the night. The next day the attack was renewed along the whole line. Thomas strengthened himself in his advanced position, repelling every effort of the enemy to recover the lost ground. Sherman succeeded in carrying Missionary ridge, and Hooker, after partially carrying Lookout mountain, intrenched himself in a strong position, compelling the abandonment of the mountain by the enemy during the night. On the 25th the battle raged from dawn till dark. Missionary ridge, Lookout mountain-top, and all the rifle-pits in the valley, were carried by desperate fighting. The confederate army was routed, and pursued by Sherman and Hooker back to Georgia. The union loss was between 6,000 and 7,000 in killed, wounded, and missing. The confederate loss in killed and wounded is estimated at 2,500; in prisoners, 6,000. The effect of this battle was to cut off Bragg from communication with Longstreet, and to force the latter to abandon the siege of Knoxville and retreat into Virginia. C. has become one of the three leading manufacturing cities in the state.

CHATTEL (Fr. *chatel*, old Fr. *chaptel*, from Lat. *capitale*, corrupted into *captale* and *catallum*, meaning the capital or principal sum in a loan; hence goods in general, especially cattle, as distinguished from land), in the law of England, is a term used to designate any kind of property which, with reference either to the nature of the subject or the character of the interest possessed in it, is *not freehold*. Regarded from a positive

point of view, C. included not only all movable property, but all property which, though immovable, was not held on a feudal tenure. Any estate, then, or interest in lands and tenements not amounting to freehold, is a chattel. But as between property thus "savoring of reality" and mere personal movables—money, plate, cattle, and the like—there was a manifest distinction, chattels were, consequently, distinguished into *chattels-real* and *chattels-personal.* Both descriptions of C., in the eye of the ancient law of England, were regarded as inferior to freehold, and formed a subordinate class of property. As distinguished from estates of inheritance, or for life in things immovable, such estate is called *personal,* the others being *real* estate. Till the passing of 8 and 9 Vict. c. 106, livery of seizin was required to pass an estate of inheritance, or for life in corporal hereditaments of feu tenure, but such was no more required for the transfer of a C. real than of a C. personal. A C. *real* is also transmitted on the owner's death to his executor or administrator, like a C. personal, and does not descend to his heir like a freehold of inheritance. There is an exception to this rule, however, in the case of chattels which, owing to their intimate connection with property of a freehold nature, cannot be separated from it without injury. Such, for instance, are the muniments of title to an estate, growing grass, deer in a park, and actual fixtures, all of which go to the heir, and not the executor. The tenant of a C. real, like the tenant of a C. personal, is, moreover, said not to be *seized,* like the tenant of a freehold, but to be *possessed.* Lastly, there can be no estate tail in a C. real more than in a C. personal, except in the case in which either of them can be regarded as an heir-loom. Formerly, C. might be disposed of by will at an earlier age than real estates, but this was altered by 1 Vict. c. 26.

CHATTERER, a significant popular name, often applied to the birds of the family *ampelidæ,* a family of the order *insessores* and tribe *dentirostres,* having a depressed bill like that of the fly-catchers (*muscicapidæ*), but somewhat shorter and broader in proportion, and slightly arched. To this family belong the cotingas, wax-wings, piauhaus, caterpillar-hunters, etc. They are found chiefly in the warmer parts of the old world, although America also produces some. They inhabit low grounds or forests, feeding chiefly on insects and their larvæ. Some of them possess powers of song almost equal to those of the nightingale. Many of them are birds of gorgeous plumage.—Only one species is British, sometimes called simply the C., sometimes the Bohemian C., or wax-wing (q.v.).

CHATTERTON, Thomas, an English poet, whose youth, genius, and tragical death have made him one of the wonders of English literature, was b. at Bristol, Nov. 20, 1752. His father, who had once been a chanter in the Bristol cathedral, and also master of a kind of free-school, died two or three months before the poet's birth. C. was educated at a parish-school, was considered a dull child, but, making acquaintance with a black-letter Bible which his mother often used, the dormant spirit flashed up. From early years he was fond of all kinds of antiquities; he clung around old walls like the ivy, and haunted twilight ruins like the bat. At the age of 14 he was apprenticed to Mr. Lambert, an attorney. His situation here was uncomfortable; he took his meals in the kitchen with the footboy, and, when refractory, was chastised with a ruler. In Oct., 1768, the new bridge at Bristol was opened, and C. sent to a newspaper an account, in antique phraseology and spelling, of the ceremonies attending the opening of the old one several centuries before—the whole purporting to be taken from an ancient MS. To a certain Bristol pewterer, Burgum by name, he presented himself, and astonished the craftsman by the sight of a parchment, in which his pedigree was traced back to the Norman conquest, adorned by many a splendid marriage, and many a knightly name. He also exhibited to his friends copies of old poems, which, he said, were composed by one Thomas Rowley, a monk of the 15th century. These matters made some stir in his native city, but not enough to satisfy C., who resolved to fly at higher game. Accordingly, Horace Walpole, at that time collecting additional materials for his *Anecdotes of Painting in England,* received from C. several pages of antique writing, accompanied by a short note. The pretended MS. gave biographical sketches of celebrated painters who had flourished in England several centuries ago, and of whose existence Walpole had never dreamed. Walpole, put off his guard, answered his unknown correspondent at once; expressed his delight at receiving the MS.; and desired, as a personal favor, that all the other antique writings, poems included, mentioned in the note, should be forwarded. C., highly elated, immediately sent accounts of a great many more painters and poets, and also gave some slight sketch of his personal history. On receipt of this second communication, Walpole suspected a trick. The poems he showed to Mason and Gray, who at once pronounced them forgeries; he then wrote C., expressing his suspicions as to the genuineness of the MS., and administering at the same time a great deal of excellent advice. C. replied, desiring that the MS. should be returned at once; but, by the time the letter reached London, Walpole was about to start for Paris, and it was allowed to remain unanswered. On Walpole's return some six weeks thereafter, a fierce note from C. awaited him, the contents of which must have brought the blood to his polished and urbane brow; indignant, he bundled up the MS., and returned it without a word of explanation.

From his earliest youth, C. had a ghastly familiarity with the idea of suicide. Among

his papers preserved in the British museum, is a last will and testament, "executed in the presence of Omniscience, the 14th of April, 1770," full of the wildest wit and profanity. Another document of similar purport, falling into the hands of his friends, led to his dismissal from Mr. Lambert's office. Released from what he considered the slavery of law, C.'s eyes turned to London, and in that city he arrived, carrying with him all his Rowley MS. and several modern poems, on Tuesday, the 24th April, 1770, and took up his abode with one Walmsley, a plasterer, in Shoreditch. No sooner had he settled there, than he began to work as with a hundred hands. During the last few months of his life, he poured forth squibs, satiric poems, political essays, burlettas, letters in the style of Junius, and meditated writing a history of England, to appear in parts. For a time, his prospects seemed golden enough. He obtained an introduction to lord mayor Beckford; he sent glowing letters home, accompanied by presents to his mother and sisters. Ultimately, he left the plasterer's in Shoreditch, and took lodgings in Brooke street, adjoining Holborn. Unhappily for C., editors of opposition papers were willing enough to insert and praise his articles, but were disinclined or unable to render an equivalent in cash. Possibly they conceived that a patriotism so ardent must be its own reward. The means of life were now fast failing. In desperation, he attempted to procure an appointment of surgeon's mate in a vessel going to Africa, but failed. This was the last drop that made the cup overflow. On Saturday, the 25th Aug., his landlady, alarmed that her lodger did not make his appearance, had the door of his room broken open; saw the floor littered with small pieces of paper, and C. "lying on the bed with his legs hanging over, quite dead." Just at this time, Dr. Fry of Oxford, who had seen or heard something of the Rowley poems, was on the eve of starting for Bristol to make inquiry into the matter. Sad enough to think on now: a little promptitude on the one hand, a little patience on the other, and the catastrophe might have been averted.

C. died before he reached his 18th year, and takes his place as the greatest prodigy in literature. Indeed, in our judgment of him, age cannot be taken into account. He never seems to have been young. His intellect was born fully matured. He was equally precocious in other respects. In his letters, he speaks of the relation of the sexes in the tone of a sated *roué*. He never seems to have felt the delicious shame and ingenuousness of youth; over his heart never was outspread "the bloom of young desire and purple light of love." The *Kew Gardens* is written in the style of Churchill, and it possesses all that master's vigor, and every now and then we come on a couplet turned with the felicity of Pope. His genius, however, is in its greatest perfection in the ancient poems. No poet, before or since, has written a tenderer strain than the lament in *Ælla*, or conceived a bolder image than the personification of freedom in the ode to liberty in his *Tragedy of Godwin*. C.'s life has been written by many hands, but the best and most sympathetic sketch of it is that given by prof. D. Masson of Edinburgh university in his collected essays.—See *The Poetical Works of Thomas Chatterton*, by the Rev. Walter Skeat, M.A. (1875).

CHATTOO'GA, a co. in n.w. Georgia, on the Alabama border, intersected by the C. river; 360 sq.m.; pop.'80, 10,021—2040 colored. The surface is somewhat mountainous. Limestone, marble, lead, and iron are found; and wheat, corn, oats, and cotton are raised. Co. seat, Summerville.

CHAUCER, GEOFFREY, the father of English poetry, was b. most probably about 1340, though the traditional date is 1328. Recent researches have made it clear that C. was the son of John Chaucer, a London vintner. It has been said that he studied at Cambridge, and afterwards removed to Oxford. While at the university, he wrote *The Court of Love*, and *The Book of Troilus and Cresseide*. At one period he seems to have turned his attention to law, and to have become a member of the Inner Temple. About these matters his biographers, knowing little, have conjectured much. The only particular of C.'s youth of which an anxious posterity can be certified is, that he one day thrashed a Franciscan friar in Fleet street, and was fined two shillings for the exploit on the next. History has preserved this for us, but has forgotten all the rest of his early life, and the chronology of all his poems.

In 1359, C. assures us, on his own authority, that he served under Edward III. in his French campaign, and was therein made prisoner. The date of his return from captivity, and of his subsequent marriage, cannot now be ascertained. He espoused Philippa, youngest daughter of sir Payne Roet, whose estates lay in Hainault. His wife's sister, Katherine, ultimately became the wife of John of Gaunt, duke of Lancaster; and it may be presumed that the high connection thus established aided, in no inconsiderable degree, the poet's advancement in life. After his marriage, he began to mix in public affairs. He was sent on an embassy to Genoa in 1372, and, on that occasion, has been supposed by some to have had an interview with Petrarch, then residing at Padua, and to have heard from his lips the story of *Griselda*. On his return, he was appointed controller of the customs for wools, and in the same year the king granted him a pitcher of wine daily for life. In 1377, C. proceeded to Flanders in the retinue of sir Thomas Percy, afterwards earl of Worcester; and for several years thereafter he was employed assiduously in embassies and other business connected with the public service. In 1386, a commission was issued to inquire into alleged abuses in the department of

the customs, and C. was dismissed from his controllership in the Dec. of that year. On meeting this fact, one cannot help remembering that Edward made the writing out of the accounts in C.'s own hand the condition of his holding office. Had the great poet neglected his duties? It has been conjectured by some, that after his disgrace C. became embarrassed in circumstances, and apparently with reason, for about this time he canceled both his pensions, and consigned them to one John Scalby, "to whom they were probably sold under pressure of distress," says his latest biographer. In 1387, C. lost his wife. Where he spent his closing years, cannot now be ascertained. Godwin surmises that in his distress he retired to Woodstock, and composed there *The Canterbury Tales*. It seems, however, to be tolerably certain that during the last years of his life he was resident in London. There he died on the 25th Oct., 1400, aged 74, and was buried in Westminster abbey, the first of the long line of poets whose ashes make that pile so venerable.

C. was a worthy reprcsentative of the splendid 14th century. He was a master of the science, the theology, and the literature of his time. He had seen many men and cities, and had formed no inconsiderable unit in imposing ceremonies of state. His poems are numerous, and exhibit every variety of poetical excellence. His earlier performances, such as *The Flower and the Leaf, The Romaunt of the Rose*, are, after the French fashion then prevalent, gorgeous allegories full of queens and kings, bowers, bevies of beautiful ladies, brave knights, and pious nightingales that sing the praises of God. They appeal potently enough to the eye, but they do not in the slightest degree touch the heart, or relate themselves to human concerns. Quite different *The Canterbury Tales*, so full of humor, pathos, and shrewd observation. In these tales, English life, as it then existed, is wonderfully reflected—when the king tilted in tournament, when the knight and the lady rode over the down with falcon on wrist, when pilgrimages bound for the tomb of St. Thomas passed on from village to village, when friars sitting in tavern over wine sang songs that formed a remarkable contrast with the services they so piously and sweetly intoned. All that stirring and gayly appareled time—so different from our own—is seen in C.'s work, as in some magic mirror; and in his case, as in every other, when the superficial tumults and noises that so stun the contemporary ear have faded away, leaving behind that which is elemental and eternal, the poet is found to be the truest historian. Among C.'s other writings may be mentioned, *The Book of the Duchess; The House of Fame;* and *The Legend of Good Women.* The genuineness of *The Court of Love* and of *The Flower and the Leaf* is denied by Mr. Furnivall, and by Mr. Skeat in his new edition of C. (4 vols., 1878).

CHAUCI, an important tribe of ancient Germany, who dwelt between the Elbe and the Ems. Tacitus records that they were conspicuous for their love of peace and justice, being powerful but not ambitious, ready to resist aggression, but never provoking war. They finally merged into the wider designation of Saxons.

CHAUDES-AIGUES, a t. of France, in the department of Cantal, about 12 m. s.s.w. of St. Flour. It is celebrated on account of its hot mineral springs, which have the property of discharging grease from sheep's wool, and vast numbers of fleeces are sent hither annually to be washed. The waters are also taken for rheumatism and cutaneous diseases. Pop. '72, 1100.

CHAUDET, Antoine Denis, 1763–1810; a French artist, whose statue of Œdipus, finished in 1801, established for him a high reputation. He also excelled in designing and penciling; and illustrated the works of Racine for Didot. Among his statuary are "Paul and Virginia," "Sensibility," "Surprise," a silver statue of "Peace," and the "Napoleon" that crowned the Vendome column. His wife, Jeanne Elizabeth Gabion, was his pupil in painting, and produced many fine pictures.

CHAUDFONTAINE, a village charmingly situated in the valley of the Vesdre, a few miles from Liége, in Belgium, and celebrated for a hot spring which supplies water for hot-baths. There are hotels and lodging-houses for the accommodation of visitors. The place is a favorite resort of the Liégois. There is here a station on the railway from Liége to Aix-la-Chapelle. Pop. '73, 1393.

CHAUDIÈRE, the name of a river and of a lake of Canada. The river joins the St. Lawrence from the s., about 7 m. above Quebec, forming the celebrated falls of its own name, about 2½ m. from its mouth. The lake—merely one of the many expansions of the Ottawa—has on its right the city of that name, the metropolis of the united colony.

CHAUFFEURS, or Garrotteurs, outlaws during the French reign of terror who roamed over the country in organized bands, under the lead of Johann Buckler, or Schinderhannes. They garroted men and women, and roasted their feet to compel them to disclose treasure. In 1803, vigorous measures were taken which resulted in their suppression.

CHAULIAC, or CHAULIEU, Gui de, a surgeon of France, of the 14th c., who was physician to three of the popes of Avignon. In his profession he was far in advance of the time, and his works are still regarded as important. He is credited with laying the foundation of the modern principles and practice of surgery. One of his works describes the plague or black death of 1348.

CHAUMETTE, Pierre Gaspard, one of the most extravagant characters of the French revolution, was b., 1763, at Nevers, and made his first public appearance at the Cordeliers' club, where he was introduced by Camille Desmoulins. His "sans-culottism" gained for him such popularity, that he was appointed procurator of the community of Paris, in the place of Manuel. C. was very enthusiastic in favor of the "worship of reason." In his zeal, he rejected his own Christian name, Pierre, as having been sullied by saintly associations, and styled himself "Anaxagoras." The institution of the tribunal of the revolution, the decree for a revolutionary army, and the law against suspected aristocrats, were carried into effect by C. along with others. He also proposed that the whole French nation should be made to wear wooden shoes, and to subsist on potatoes; but this was too much even for the chimerical enthusiasm of his compatriots. His antics, however, in connection with the "worship of reason" excited the disgust of Robespierre, who devised measures for bringing the whole company of actors under Hébert to the scaffold C. was arrested and imprisoned on a charge of having been implicated in a plot against the convention, and was executed, April 13, 1794.

CHAUMONOT, Pierre Marie Joseph, 1611–93; a French Jesuit missionary among the North American Indians. His work was chiefly among the Hurons of Canada, among whom he established missions and schools. He left a grammar of the Huron tongue. In 1655, he visited the Onondagas.

CHAUMONT, a t. of France, in the department of Haute-Marne, on an elevation between the rivers Marne and Suize, about 140 m. s.e. of Paris. It is generally well built, with clean, spacious streets, and fine promenades round the upper part of the town. There are considerable manufactures, including hosiery, cotton, yarn, gloves, etc. On the 1st of Mar., 1814, the allied powers here bound themselves by treaty against Napoleon, in the event of the negotiations at Chatillon ending unsatisfactorily. Pop. '76, 8,791.

CHAUNCEY, Charles, ll.d., 1777–1849; son of the Connecticut attorney-general, became a member of the Philadelphia bar, where he won high rank.

CHAUNCEY, or CHAUNCY, Charles, ll.d., 1747–1823; a native of Massachusetts, admitted to the bar in 1768, and settled in New Haven. He was attorney-general of the state, and in 1789, judge of the superior court.

CHAUNCEY, or CHAUNCY, Isaac, 1772–1840; a capt. in the U. S. navy. He began sea-faring life in the mercantile service, in which he was conspicuous for enterprise and energy. In 1799, he entered the navy as a lieut., and in 1802 was made acting capt. commanding the *Chesapeake,* of 38 guns, the flag-ship of the squadron sent against Tripoli, serving with distinction in that brief war. In 1806, he was made capt., and in the war of 1812 had command on the great lakes. In 1813, he participated in the capture of York, now Toronto, and of fort George, driving the enemy from the whole of Niagara region. On one occasion he captured five British vessels, and a regiment of troops. In Aug., 1814, he blockaded a British fleet in Kingston harbor until the close of navigation. Before the lake opened again, peace was concluded. In later years he was in command of the navy-yard at Brooklyn, and of the squadron that conveyed an officer to make the treaty of peace with Algiers. At the time of his death he was president of the board of navy commissioners.

CHAUNCY, Charles, 1705–87; great-grandson of the president of Harvard, a graduate of that institution, and pastor of the First church in Boston in 1727. He published many works, among which were *Complete View of the Episcopacy; Seasonable Thoughts on the State of Religion in New England; Mystery Hid from Ages, or the Salvation of all Men;* and *The Benevolence of the Deity.* He officiated 60 years in one parish.

CHAUNCY, or CHAUNCEY, Charles, 1592–1672; a native of England, educated at Cambridge, where he became professor first of Greek and afterwards of Hebrew. His puritanism involved him in difficulties with the ecclesiastical authorities, and he was fined and imprisoned. In 1638, he emigrated to New England, and was for three years pastor at Plymouth, Mass., and afterwards at Scituate. There having been a change in ecclesiastical policy in England, he was about to return to his vicarage in Ware, when Henry Dunster, the first president of Harvard college, resigned, and the place was offered to Chauncy. He at once accepted (1654), and remained in office all his life. He left six sons, all of whom graduated at Harvard, and all became preachers.

CHAUNY, a t. of France in the department of Aisne, about 18 m. w.n.w. of Laon. It is built partly on the right bank of, and partly on an island in, the river Oise, which is here navigable. It is an old, rather uninteresting place, with manufactures of sacking, hosiery, chemicals, and leather, and an active trade. Pop. '76, 8,982.

CHAUSSES, in the armor of the middle ages, were defense-pieces for the legs. Some were made of padded and quilted cloth, with metal studs; some of chain-mail; some of riveted plates; and some of banded mail. It was not unusual to fasten them by lacing behind the leg.

CHAUTAUQUA: co. Kan. See page 894.

CHAUTAUQUA, N. Y. See page 894.

CHAUTAU'QUA, a co. in w. N. Y., having lake Erie on the n. and Pennsylvania on the s. and w.; drained by Conewango creek, and traversed by the Erie, the Lake Shore, the Atlantic and Great Western, and other railroads; 1000 sq.m.; pop. '80,

65,340. Among mineral productions are iron and marble; also there are sulphur springs and natural gas, which has been successfully used in lighting houses. The surface is mostly level, and the soil fertile, producing wheat, oats, corn, barley, potatoes, hay, cheese, butter, wool, and maple sugar. Co. seat, Mayville. See Jamestown.

CHAUTAU'QUA LAKE, in Chautauqua co., N. Y., 730 ft. above the level of lake Erie and 1382 ft. above the ocean. It is 18 m. long and 1 to 3 wide, with a navigable outlet to Alleghany river.

CHAUVEAU, Pierre J. O., b. Quebec, 1820. In 1844, he was chosen to the provincial legislature, became solicitor-general in 1851, and provincial secretary in 1853. In 1855, he was appointed superintendent of education for Lower Canada. On the organization of the confederation, he became first minister of the government of Quebec, and in 1873 was chosen speaker of the Canadian senate. He is the author of *Charles Guérin*, the first Canadian-French novel ever published.

CHAUVENET, William, ll.d., 1819–70; b. Penn.; a graduate of Yale, and long connected with Alexander D. Bache in magnetic and meteorological observations at Girard college. In 1841, he was appointed professor of mathematics in the navy, and assisted in the establishment of the naval academy at Annapolis and of its observatory, of which he was made director. He was for a time professor of mathematics and astronomy in Washington university at St. Louis, Mo. Among his works are *Manual of Spherical and Practical Astronomy; The Binomial Theorem of Exponents and of Logarithms;* and *Plane and Spherical Trigonometry.*

CHAUVIN, Etienne, 1640–1725; a minister of the reformed religion, b. at Nîmes. At the revocation of the edict of Nantes, he went to Rotterdam, and in 1695, he was made professor of philosophy at Berlin. His principal work is a *Lexicon Rationale, sive Thesaurus Philosophicus.* He also wrote *Theses de Cognitione Dei,* and started the *Nouveau Journal des Savants.*

CHAUVINISME. "Chauvin" was the name of the principal character in a French comedy, which was played with immense success at the time of the restoration. He represented a bragging veteran of the empire, who was continually talking of his achievements at Austerlitz and Jena, and his determination to take a brilliant revenge for Waterloo. Since then, a *chauviniste* has come to mean a man who has extravagant and narrow-minded notions of patriotism, and corresponding enmity towards foreign peoples.

CHAUX DE FONDS, a t. of Switzerland, in the canton of Neuchâtel. 9 m. n.w. of the city of that name. It is situated in a bleak valley, at an elevation of 3,070 ft. above the sea, and is scattered over a large area, almost every cottage being surrounded by a garden or croft. It is one of the chief seats of the manufacture of clocks and watches in the canton. The mechanists work chiefly at home, each devoting himself to a particular portion of machinery. This industry employs 12,000 hands. Pop. '71, 19,930.

CHA'VES, a t. in Portugal, near the frontier, on a plain near the right branch of the Tamega, which is here crossed by an old Roman bridge of 18 arches; pop. 4,870, but formerly as many as 20,000. . Its hot saline springs were known to the ancients. In one of its churches is the tomb of Alphonso I.

CHAYENPUR', a fortified t. of Nepaul, in the n. of India, about 120 m. to the e. of Khatmandu, the capital of the state, being in lat. 27° 20′ n., and long. 87° 3′ east. It is the chief town of a district which yields rice, wheat, cotton, ghee or butter, timber, spices, sugar, tobacco, and pearls.

CHAY ROOT, Choya, or Sayan (*oldenlandia umbellata*), a perennial herbaceous plant of the natural order *cinchonaceæ,* said to be a native both of India and of Mexico. It is cultivated on the coast of Coromandel for the sake of its long, orange-colored roots, the bark of which affords a beautiful red dye. The quality of the bark is said to be improved by keeping it for some years. It is the coloring matter obtained from C. R. which is used to paint the red figures on chintz. C. R. is the Indian madder, and in it some tribes in Ceylon formerly paid their tribute.

CHAZELLES, Jean Mathieu de, 1657–1710; a mathematician and engineer; b. at Lyons. He was for some time employed by Cassini in measuring an arc of the meridian, and finally became hydrographic professor for the galleys at Marseilles. In 1689, he set sail from Rochefort with 15 galleys, cruised as far as Torbay, in England, and took part in the descent upon Teignmouth. C. published many maps and charts in the *Neptune Français,* and traveled to Egypt, where he measured the pyramids. He was made a member of the academy in 1695.

CHAZY, a village and township in Clinton co., N. Y., on the w. shore of lake Champlain; the village on the Plattsburg and Montreal railroad; pop. of town, '80, 3,147. One of the mineral products of the township is the C. limestone, of the lower Silurian formation.

CHEA'DLE, a small but neat market-t. of England, in the moorland district of the n. part of the co. of Stafford, 14 m. n.n.e. of the town of Stafford, 3 m. from the Froghall station on the Churnet valley branch of the North Staffordshire railway, and 4 m. from the Blyth bridge station on the main line from Derby to Crewe. The town is

seated in a pleasant vale, surrounded by hills mostly planted with fir and other trees. The parish church (St. Giles) was a very ancient structure, but was rebuilt in 1837–38. A magnificent Roman Catholic church, erected at the sole expense of John, earl of Shrewsbury, was opened in 1846. There are several dissenting chapels, various schools, a mechanics' institute, a large tape manufactory, and also one for silk. There are copper and brass works a short distance from the town, and coal and limestone abound in the vicinity. Pop. '71, 2,929.

CHEATHAM, a co. in n.w. Tennessee, on Cumberland river; 350 sq.m.; pop. '80, 7955—1661 colored. Chief productions, corn, oats, and tobacco. Co. seat, Ashland City.

CHEATING. In the technical language of the English law, C. means the offense of fraudulently obtaining the property of another by any deceitful or illegal practice short of felony, but in such a way as that the public interest may possibly be affected. In order to constitute C., the fraud must be of such a kind as that it could not be guarded against by common prudence. C., in this sense, is an offense at common law, and indictable, which is not the case with imposition in a private transaction. The law of Scotland has no such distinction. See WEIGHTS AND MEASURES, FALSE PRETENCES, CHARACTER TO SERVANT.

CHEATING (*ante*), defined in American law as "deceitful practices in defrauding or endeavoring to defraud another of his known right, by some willful device contrary to the plain rules of common honesty." Bouvier says: "In order to constitute a cheat or indictable fraud, there must be a prejudice received, or such injury must affect the public welfare, or have a tendency to do so." Courts have held that it is not indictable for a person to obtain goods by false verbal representations of his credit in society, and of his ability to pay for them; or to violate his contract, however fraudulently it may be broken; or fraudulently to deliver a less quantity than was contracted for and represented. To cheat one of his money or goods by false weights or measures has always been an indictable offense. The word "cheat" is not actionable unless spoken of a plaintiff in relation to his profession or business.

CHEAT RIVER, a stream in West Virginia, formed by brooks rising in the Alleghany mountains, flowing through a region rich in iron and coal, and joining the Monongahela in Fayette co. It furnishes abundant water-power, and is in some parts navigable for steam-boats.

CHEBOY'GAN, a co. in n. Michigan, forming, with Emmett co., the extreme northern portion of the peninsula; 500 sq.m.; pop. '80, 6524. It contains a number of small lakes. Agriculture is the main business. Co. seat, Duncan.

CHECK, a variegated cloth, the pattern of which consists of rectangular spaces like a chess-board (Fr. *échec*, chess), in black and white, or of various colors.

***CHECK** is a money order on a banker or other party having funds of the drawer. It must bear a penny stamp, and is payable to bearer on demand. If not presented within a reasonable time the holder shall not claim against the drawer should the banker fail. The banker bears the risk of forgery, unless facilitated by carelessness in drawing. A. C. is held as payment of a debt until dishonored on presentation; it is not payable after the drawer's death.

CROSSED CHECK is an ordinary C. with two transverse lines drawn across it, which has the effect of making it payable only through a banker. When a particular banker's name is written between the lines the C. is said to be *specially* crossed, and is only payable by the banker whose name it bears. Wanting a particular name, it is said to be *generally* crossed, and is payable through any banker. An ordinary C. may be crossed either generally or specially by the holder. Obliteration of the crossing or any alteration of a C., except as provided for by the crossed checks act (1876), is felony. See *Supp.*, page 894.

CHECKERBERRY. See GAULTHERIA, *ante*.

CHECKERS. See DRAUGHTS, *ante*.

CHECKY (Fr. *échiqueté*). In heraldry, when the field or any charge is composed of small squares of different tinctures, generally metal and color, it is said to be checky.

CHEDDAR, a village in Somersetshire, on the s. side of the Mendip hills, 2 m. s.e. of Axbridge, with a level country to the south. It lies at the entrance of a deep rocky gorge, nearly 1 m. long, overhung by stupendous mural limestone precipices, containing caverns—one being 300 ft. long—filled with fantastic stalactites and stalagmites. The celebrated C. cheeses are produced on the rich grass-farms around. The church is supposed to have been built about 1400, and has a sculptured stone pulpit. Pop. of parish '71, 2,200.

CHÉDOTEL, the pilot of the expedition sent from France in 1598 to the coasts of Nova Scotia, under command of the marquis de la Roche. Arriving at Au Sable island (90 m. s.e. of Nova Scotia, an uninhabited island 25 m. long by 1 to 1½ wide), 50 men were landed, and the ships departed for the mainland But weather prevented a landing at the island on returning, and the men were left there seven years. In 1605, they were sent for, and 12 only were found alive.

CHEDU'BA, an island off Aracan, in the bay of Bengal, stretching from lat. 18° 40′ to 18° 56′ n., and from long. 93° 31′ to 93° 50′ e. Its area is about 250 sq.m., and its pop. 9,000. Along with the adjacent mainland, it was ceded to the British at the close of the first Burmese war. The soil is fertile, yielding rice, tobacco, sugar, indigo, cotton, hemp, and large quantities of a vegetable oil, equally fitted for burning and for varnishing. The principal mineral is petroleum. The coast presents earthy cones, which emit mud and gas, and about 100 years ago a severe earthquake is believed to have extended the limits of the island.

***CHEESE** is the common form in which the caseine (q.v.) of milk is used in a separate state as an article of food. In new milk, the C. is present in a condition soluble in water, and is generally separated therefrom in a coagulated or clotted form, on the addition of a little rennet (q.v.). In the preparation of C., the milk is gently heated to a temperature of 110° to 112° F., and placed in a large wooden tub, where the rennet is added, and the operation of earning goes on. In about half an hour, the curd is sufficiently formed. The liquid whey being pressed out, the curd is chopped into small pieces of the size of a walnut with a knife, called a curd-cutter, salt is added, and the fragments of curd introduced into a cloth placed in a cheese-vat or chessart, which is a wooden tub of varying size and shape, perforated at the sides and bottom. The whole is then put under a cheese-press (q.v.), and subjected to great pressure, which consolidates the curd or caseine, and at the same time squeezes out the remaining portions of the whey. After two or three hours, the half-formed C. is turned and re-turned, each time being subjected to renewed pressure, till in about two days it is sufficiently compacted. It is then removed from the cheese-vat, and placed on a shelf in a dry, airy room, where, being repeatedly turned, it gradually dries, and gets aged or seasoned sufficiently for market in about six months.

There are many varieties of C., which partly owe their difference to the food of the cows, but in greater part to differences in the mode of treating the milk. *Skimmed-milk C.* is prepared from milk from which the cream has been removed, and a rich color is communicated by adding a little arnotto (q.v.) to the milk before coagulation. *Sweet-milk C.* is procured in a similar manner from the whole milk, and contains much of the butter along with the caseine. *Stilton C.* is made in Leicestershire, by adding the cream of the evening's milk to the new milk of next morning; and as there is always more trouble in expelling the whey from curd containing butter, there is a difficulty in preparing this variety of C., from its liability to fermentation and bursting, *Cheddar C.* is made in Somersetshire, from the whole milk, and the whey is several times skimmed off, heated, and added to the curd to scald it. *Cheshire* and *Double Gloucester* are made from the whole milk; *Single Gloucester*, from half new milk and half skimmed milk. *Gouda C.* is prepared in Holland from skimmed milk curdled by muriatic acid instead of rennet, and for this reason it is not infested with mites. Holland exports annually about thirty millions of pounds of C., the greater portion coming to England. *Suffolk C.* is made from skimmed milk. *Parmesan C.*, obtained from Parma, in Italy, is also made from skimmed milk, and owes its fine rich flavor to the superior herbage on the banks of the river Po. The cows are kept in the house nearly all the year round, and fed in summer with cut grass. Some of the cheeses are so large as to contain 180 lbs.; and the milk of 100 cows is required to produce one of this size. *Swiss C.* is flavored with herbs, and especially that of Gruyère, which is very pleasant to the taste. Gruyère cheeses weigh from 40 to 60 lbs. each, and are exported in large quantities.

Cream C. is prepared from cream curd which has been placed in a cloth, and allowed to drain without the assistance of pressure. Bath and York supply C. of this description. In the fabrication of C., minium or red-lead has occasionally been employed as a cheap coloring substance, and cases of poisoning have resulted therefrom. Carrots, saffron, and marigold flowers have also been used for imparting color as well as flavor.

Dunlop C., though nowhere so well made as in the parish at Ayrshire, from which it derives its name, is now manufactured in the dairy districts of Scotland generally. The cheeses are made of various sizes—from a quarter to half a hundredweight. Sometimes the entire milk is used, but generally the cream is removed from the evening's milking. Of late years, great improvement has taken place in the manufacture of C. in the Scottish dairy districts, Ayrshire, Lanarkshire, Wigton, and Kirkcudbright. Much of what is sold as cheddar (q.v.) C. is really made in Scotland. The annual Kilmarnock "cheese show" is one of the largest in the world, the value of the C. exhibited being often more than £20,000.

When sufficiently dry for use, C. still retains from 35 to 44 per cent water, and, besides the caseine, contains a greater or less proportion of oil or fat and saline matter —the latter mainly consisting of common salt, originally present in the milk, and added during the manufacture of the cheese. As an article of diet, C. is highly nutritious; but from its costive properties, it is mainly used as a condiment in small quantity after an ordinary meal, and is then serviceable in giving an impetus to the process of digestion. To serve the purpose of a digester, C. must be old and partially decayed, or moldy. It then acts as leaven, and causes chemical changes gradually to commence among the particles of food which has previously been eaten, and thus facilitates the dissolution which necessarily precedes digestion.

CHEESE PRESS.—The old method of compressing curd and expelling the whey from it is still employed in many places, the mere piling of weights on the cheese-vat. Sometimes the action of a screw is employed. Among improved dairy implements are now reckoned, however, many ingenious and elegant forms of C. press, generally depending on the action of a lever. They are much more convenient than the clumsy contrivance which they have superseded. Factories for the manufacture of C. have been established in the United States and Canada, by which C. is produced in immense quantities, and a factory on a similar principle has been lately established in Derbyshire. The C. made in the United States and Canada is now imported into Great Britain in immense quantities, and is steadily increasing in favor. See *Supp.*, page 894

CHEESE (*ante*), manufactured in immense quantity in the eastern and northern United States, particularly in New York, Ohio, Illinois, Vermont, Massachusetts, Pennsylvania, Wisconsin, and Michigan. Of 163,000,000 lbs. returned as made in the census year of 1870, 101,000,000 lbs. were made in N. Y. State. Within recent years nearly all descriptions of foreign cheese are imitated in this country, and the most of the imitations are equal to the imported article. Many farmers have ceased to manufacture C. in their own dairies. The milk is taken to large factories, where it is weighed and emptied into a common receptacle. The processes following are directed by trained superintendents, and the average product is greatly improved. The farmers receive either payment for the milk as brought, or a share in the proceeds of the manufacture.

CHEESE-HOPPER, the larva of *piophila casei* or *tyrophaga casei*, a small *dipterous* (two-winged) fly, of the large family *muscides*, the same to which the house-fly, blow-fly, etc., belong. The perfect insect is about a line and a half in length, mostly of a shining black color; antennæ, forehead, and some parts of the legs rufous. It is a pest of dairies and store closets, laying its eggs in cracks or crevices of cheese, the destined food of its larvæ. To preserve cheeses from this pest, it is of advantage to brush or rub them frequently, and to remove all cracked or injured cheeses from large stores, besides keeping them dry and in a well-aired place. The same rules are applicable to their preservation from the other insect larvæ by which they are sometimes infested, of which the most notable are those of the bacon beetle (see DERMESTES), and of another species of dipterous fly, *musca corvina*.

CHEESHAHTEAUMUCK, CALEB, an Indian, b. 1646; the only aboriginal graduate of Harvard college.

CHEE'TAH, CHIT'TAH, or HUNTING LEOPARD, *Felis jubata* or *Cynailurus jubatus*, an animal of the feline family, but differing from all the rest of that family in its longer and narrower feet and less retractile claws, which are also more blunt and less curved. With these peculiarities are associated a greater length of limbs than is usual in feline animals, adapting it to take its prey by running rather than by leaping, and an intelligent and tractable disposition, constituting an additional point of resemblance to dogs; with which, however, the form of the head and the internal anatomy have nothing in common, but are entirely feline. The C. is in size about equal to a leopard, but the body and limbs are longer. It is very widely distributed, being found in Senegal, s. Africa, Persia, India, Sumatra, etc. Its geographic range extends as far n. as the Caspian sea, and the steppes of the Kirghiz Tartars. The Asiatic species described as *felis venatica* appears to have been fully identified with *F. jubata;* and differences in the quantity of mane, and other unimportant particulars, may probably sometimes have resulted from domestication; for this animal has been long domesticated and employed in the chase, both in Persia, where it is called *youze*, and in India. Deer and antelopes are the game principally hunted with the C., and packs are kept by Indian princes. The head of the C. is kept covered with a leather hood till the game is discovered, when the hunting party, advancing cautiously to within 200 yards of it, the hood is taken off, and the C. steathily creeps towards the herd, taking advantage of every bush and inequality for concealment, till, on their showing alarm, he is amongst them at a few bounds, and striking down his victim with a blow of his paw, instantly tears open its throat, and begins to suck the blood. It is then somewhat difficult to withdraw him from his prey, which is generally done by offering him meat. If unsuccessful, the C. does not attempt to follow the herd by running—nor does this animal seem to possess the power of maintaining speed through a lengthened chase—but slowly, and as if ashamed, creeps back to the hunters. The C. is not unfrequently to be seen in menageries in Britain. In a domesticated state, it is extremely fond of attention, and seems to repay kindness with affection. The skin is frequently imported from Africa.

CHEEVER, EZEKIEL, 1615–1708; b. in England; came to New England in 1637, and assisted in founding New Haven colony, in which he became prominent as a deacon, a minister, and especially as a teacher. He also taught in Ipswich, Charlestown, and Boston, being at the head of the famous Latin school in Boston for 38 years. He prepared the *Accidence, a short Introduction to the Latin Tongue,* and wrote *Scripture Prophecies Explained, in three short Essays.*

CHEEVER, GEORGE BARRELL, D.D., b. Me., 1807; a graduate of Bowdoin college and Andover theological seminary, and in 1832 ordained pastor of a Congregational church in Salem, Mass. He began at an early age to write for the press, contributing

prose and verse to the current magazines and quarterlies. The Unitarian controversy attracted his attention, and he wrote a defense of the orthodox system of Cudworth. Temperance also became a leading idea, and in 1835 he published in a Salem newspaper *Deacon Giles's Distillery*, a bitterly satirical allegory which had a wonderful popularity. The author was prosecuted, and sent to prison for a month. After some time passed in European travel he took charge of the Allen street Presbyterian church in New York city, and soon afterwards gave a series of lectures on the "Pilgrim's Progress" and on "Hierarchal Despotism." After another trip across the sea he became the leading editor of the *Evangelist*, a weekly religious journal in New York, for which he had been a correspondent. In 1846, he became pastor of the Church of the Puritans (Congregational) in New York city, retaining that office until 1868, when the church, whose ground-lease had expired and which was weakened by dissensions, disbanded. His ministry there was amid the fierce debate which preceded the war of the rebellion. Since that time he has not been in the active ministry, and has resided at Englewood, N. J. He has written many essays and books, among which are, *Studies in Poetry; Lectures on the Pilgrim's Progress; Wanderings of a Pilgrim; Windings of the River of the Water of Life; Voices of Nature; Powers of the World to Come; God against Slavery;* and *The Guilt of Slavery and Crime of Slave-holding.*

CHEEVER, Henry Theodore, b. Me., 1814; brother of George B.; a graduate of Bowdoin, and correspondent abroad of the *Evangelist* of New York. He was a Congregational minister in New York, New Jersey, and Connecticut, and secretary and agent of the church anti-slavery society from its beginning. He published several books of travel, memoirs, etc.

CHE-FOO, or Yen-tai, a seaport t. of n. China, on the s. coast of the gulf of Pih-chih-ti, in the province of Shantung, 30 m. e. of Tang-chow-foo. It was a place of small consequence until, under the treaty of 1858, it was opened to foreign trade as the port of Tang-chow. There is now a custom-house, a British consulate, and a considerable foreign settlement. The imports are chiefly woolen and cotton goods, iron, and opium; the exports bean-cake, bean-oil, peas, raw silk, straw braid, dried fruit, etc. There is some trade with the Russians in Mantchuria.

CHEHA'LIS, a co. in Washington territory, on the Pacific; 1600 sq.m.; pop. '80, 921. Gray's harbor, one of the few places of refuge from the ocean, is in this county. Co. seat, Montesano.

CHEILOANGIOS'COPY, a method of observing the circulation of the blood. Heretofore, with the exception of a single experiment the evidence of circulation in the human subject has been entirely circumstantial, derived from the facts of structure of the circulatory organs, and from the manner in which the blood flows from several arteries and veins. But by means of a simple arrangement, invented by Dr. C. Hüter, a German, it is now possible for one to witness the actual flow of blood in the blood-vessels of another person, and that with sufficient accuracy to detect any abnormality in the circulation, and so to obtain invaluable assistance in the diagnosis of disease. In Dr. Hüter's arrangement the patient's head is fixed in a frame, something like that used by photographers, on which is a contrivance for supporting a microscope and lamp. The lower lip is drawn out, and fixed, by means of clips, on the stage of the microscope, with its inner surface upward; a strong light is thrown on this surface by a condenser, and the microscope, provided with a low-power objective, is brought to bear upon the delicate net-work of vessels, which can be seen in the position indicated, even with the naked eye. The appearance presented is, at first, as if the vessels were filled with red injection. But by focussing a small superficial vessel, the observer is soon able to distinguish the movement of the blood-stream, rendered evident by the speck-like red corpuscles, the flow of which, in the corkscrew-like capillaries, is said by Hüter to be especially beautiful. The colorless corpuscles are distinguishable as minute white specks, occurring now and again in the course of the red stream. Beside the phenomena of the circulation, the cells of pavement-epithelium lining the lip, and their nuclei, can readily be distinguished, as well as the apertures of the mucous glands. Beside the normal circulation, various pathological conditions can be observed. By a pressure quite insufficient to cause pain, the phenomena of blood stagnation—the stoppage of the flow, and the gradual change in the color of the blood from bright red to purple—are seen. A momentary stoppage is also produced by touching the lip with ice, a more enduring stasis by certain reagents, such as glycerine or ammonia.

CHEIRAN'THUS. See Wallflower.

CHEIROL'EPIS, a genus of fossil ganoid fish, peculiar to the Devonian measures, in which eight species have been found. They had large heads, the spine continued in a rudimentary condition, and the body was completely covered with small lozenge-shaped ganoid scales. The first ray of each fin was converted into a strong spine, whose base was loosely imbedded in the flesh. The pectorals and ventrals were largely developed, while the dorsal was small, and situated behind the anal fin. The generic name, meaning "scaly-hand," was given in allusion to the large scaly pectorals.

CHEIR'OMANCY (Gr. *cheir*, the hand; *manteia*, prophecy), or Palmistry, a form of divination that professes to read the destiny of an individual by the lineaments of the

hand. In the middle ages, C. occupied the attention of Cardan, Paracelsus, and other eminent men, who elaborated it into a system. It is now, however, the exclusive property of the gypsies, who still find among maid-servants sufficient credulity to make its practice profitable.

CHEIR'OMYS. See AYE-AYE.

CHEIRONEC'TES, a genus of marsupial quadrupeds, differing from the opossums chiefly in having webbed-feet and aquatic habits. *C. palmatus* or *C. Yapock,* sometimes called the Yapock opossum, or simply the Yapock, from the South American river of that name, is common in many rivers of Brazil and Guiana. It has a soft woolly fur, the color of the upper parts of the body is gray, with large transverse patches of black, connected with a dorsal black line, the breast and belly white; the tail is long, very thick at the base, tapering to the tip, and, except at the base, covered with scales. The cheek-pouches are very large. Crustaceans are said to form the chief food of this animal, which is interesting as a sort of marsupial representative of the otter.

CHEIROP'TERA. See BAT.

CHEIROTHE'RIUM, the name given by Dr. Kaup to the animal which produced the peculiar hand-like impressions (hence the name, "hand-beast") on the triassic rocks of this country and Germany. The remains of the animal having been found, and its structure made out, this name has given place to the more characteristic one of *labyrinthodon* (q.v.).

CHEKE, Sir JOHN, who deserves to be remembered as one of the revivers of classical literature in England during the 16th c., was born at Cambridge, June 16, 1514. Entering the university of Cambridge, he devoted himself assiduously to the study of Latin and Greek, particularly the latter language, then much neglected in England. He labored earnestly to advance the study of the Greek language and literature; and when the first professorship of Greek was founded in Cambridge by king Henry VIII., about 1540, C. was appointed professor. A new mode of pronouncing Greek which he introduced was assailed by bishop Gardiner, the chancellor of the university; but notwithstanding, C.'s system prevailed. C. was for a time preceptor of the prince, afterwards Edward VI., whose elevation to the throne secured him rank, wealth, and honor. But being a Protestant, he was stripped of everything when Mary came to the throne, although other lands were given to him on his returning to the Roman Catholic church, which he did to escape burning, the only alternative offered him by cardinal Pole. His recantation preyed on his mind so much, that he died in the course of the following year, Sept., 1557. He left several works in Latin, and a pamphlet in English; and among his MSS. was a translation of the gospel by Matthew, exemplifying a plan for reforming the English language by eradicating all words save those derived from Saxon roots.

CHE-KEANG, one of the eastern and maritime provinces of China, the smallest of the eighteen. Situated in the southern portion of the great plain, it is possessed of great fertility, and produces silk, tea, and rice in abundance. Its capital, Hangchow (q.v.), an important and populous city, is the metropolis of the silk districts. "Above is Paradise," say the Chinese; "below are Soo-chow and Hangchow." Both these places were taken by the Taeping rebels in 1860. Ning-po (q.v.) is the principal port of the province. Pop., according to the Chinese census of 1812, 26,256,784. Area, 39,150 sq. miles.

CHELIC'ERÆ, or antennal claws, modified antennæ, which, in some of the crustaceans, and in most of the arachnida, serve a purpose corresponding with that of the mandibles of insects in the cutting, tearing, or bruising of food. They move, however, up and down, in a direction contrary to that of the mandibles of insects.

CHEL'IFER, a genus of *arachnida* (q.v.) of the order *trachearia,* and of the family to which, from their resemblance to scorpions without tails, the name *pseudo-scorpions,* or false scoripons, has been given, the true scorpions belonging to the order *pulmonaria.* The genus C. consists of minute species in which this resemblance is very strong. The palpi are elongated and armed with pincers. The species live under the loose bark of trees, in chinks of old furniture, etc. One species, *C. cancroides,* about a line and a half in length, is frequently to be seen in old books, herbaria, etc., and is called the *book scorpion;* it is said to be useful as feeding on the insects which are most destructive to books and collections in natural history.

CHELIUS, MAXIMILIAN JOSEPH. See page 895.

CHELM, or CHOLM, a t. of Russian Poland, in the government of the same name, 126 m. s.e. of Warsaw. It is the seat of a united Greek bishop, and has a theological seminary. The Poles were defeated here by the Russians, June 4, 1794. Pop., '67, 4,483.

CHELMSFORD, the co. t. of Essex, near the center of the co., at the confluence of the Chelmer and the Cann, 29 m. n.e. of London. The industry of C. is chiefly agricultural. The town is the seat of assizes and local courts, and has a grammar-school founded by Edward VI. Pop. '81, 10,093. On a small island called Mesopotamia, in the Chelmer, there has long been a ludicrous mock-election of a member of parliament during the county elections.

CHELMSFORD, Frederick Thesiger, Baron, b. London, 1794; a lawyer and judge; solicitor-general in 1844; and next year attorney-general, and again in the same office in 1852. In 1858, he was made lord chaneellor, and received the title of lord C. He filled the same offiee in 1866. He d. 1878.

CHELO'NIA (Gr. *chelōne*, a tortoise), an order of reptiles, corresponding in extent with the genus *testudo* of Linnæus, and of which the most obvious distinguishing character is the inclosure of the whole body in a protective covering connected with the skeleton, so that only the head, the tail, and the limbs are protruded; the limbs, four in number, and all formed on the same plan, are used by some as feet for walking on dry ground, by others as paddles for swimming. The bony covering consists of two principal parts, called the *carapace* and the *plastron;* the carapace serving as a buckler for the upper parts, and the plastron for the under parts of the body. The carapace is formed from the ribs, of which there are eight pair, and from the annular parts of the dorsal vertebræ, expanded into plates, which are joined to each other by dentilated sutures, so that the whole acquires great firmness, and the dorsal vertebræ are rendered immovable. The plastron is formed of pieces which represent the sternum or breast-bone, and which are ordinarily nine in number. So compact and strong is the case of some of the tortoises, that it will bear immense pressure without injury, the arched form of the carapace adding to its strength; whilst the creature, destitute of other means of defense, and incapable of flight, finds safety, at least in its mature state, from all enemies but man, by drawing its head, tail, and limbs within the protecting case, which in some, called box-tortoises, has certain plates movable, so as more completely to inclose them. The turtles and other aquatic chelonians cannot thus withdraw their head, tail, and limbs from danger, but the greater activity of their movements compensates for this.

The firmly fixed ribs not admitting of the movements by which respiration ordinarily takes place in other vertebrate animals, the C. gulp down air, which they inhale entirely through the nostrils; first filling the cavity of the mouth by elevating the hyoid bone, and then, by depressing it, forcing the air into the lungs, whilst the inner aperture of the nostrils is closed by the tongue. In other respects, as to aëration and circulation of blood, they resemble other reptiles.

The jaws are not furnished with teeth, but act in a manner more resembling that of the mandibles of birds, being like them hard, sharp, and horny. The food of the C. is various. Some of them, among which are all the land-tortoises, subsist exclusively on vegetable food; some of the aquatic C. pursue and eat other aquatic animals.

All the C. are strictly oviparous. Their eggs are hatched by the heat of the sun alone; they lay a great number at a time, which are covered with a calcareous shell, like those of birds. The eggs of fresh-water tortoises are in some places a lucrative article of commerce, from the quantity of oil which is obtained from them.

The C. are found only in the warmer parts of the world, but their numbers in some places are astonishingly great. None of them can properly be reckoned British, although stray turtles have, in a few instances, been found on the British shores. A few species occur in the southern parts of Europe, and some are found in the temperate parts of North America.

All the species are extremely tenacious of life; they are capable of extraordinary abstinence, and of living long after having sustained injuries which would have been immediately destructive to almost any other animal. They are also remarkable for their longevity.

The flesh of some kinds of turtle is well known as an excellent article of food. The eggs of some are equally an esteemed delicacy. Tortoise-shell (q.v.), and the oil already mentioned, are the only other valuable products of the order.

Further information concerning the C. will be found in particular articles devoted to some of the different genera and species. See also Reptiles.

Fossil Chelonia.—Foot-tracks on the triassic sandstone of Dumfriesshire were referred by their discoverer, Dr. Duncan, to tortoises. Similar tracks have been noticed in Devonian and oolite strata. Their vagueness, however, does not indicate with any certainty the animals which produced them. The first indisputable evidence of chelonian life occurs in the upper oolite, where the remains of several pond-tortoises and two or three turtles have been observed. In the newer deposits, they increase in number, so that between 70 and 80 species have been described from the tertiary strata. In the eocene deposits of the London clay, at the mouth of the Thames, there occur the remains of more species of true turtles than are now known to exist in the whole world. Some of these fossil C. were of a size proportioned to their colossal companions; as, for instance, the gigantic land tortoise (*colossochelys*) of the Sewalik hills, whose carapace was as much as 20 ft. in length.

CHELSEA, a city in Suffolk co., Mass.; pop. '80, 21,785, a suburb of Boston, with which it is connected by ferry, and horse and steam railroads. C. is separated from East Boston by C. creek, and from Charlestown by Mystic river, which is crossed by a bridge 3,300 ft. long. The principal public buildings, besides churches, are the city hall, the U. S. naval hospital, the marine hospital, odd fellows' and masonic halls, and Winnisimmet hall. C. is in the Boston customs district, and there are some manufactories in the city; but the business of many of the inhabitants is in Boston. It has the

usual civic government of mayor, aldermen, and common council; with police, fire, and water departments, board of education, etc. C. was settled in 1630 under the name of Winnisimmet, and was a part of Boston until 1738, when, with adjacent settlements, it was organized as the town of C. It was incorporated as a city in 1857.

CHELSEA, a suburb of London, in Middlesex, on the left bank of the Thames, 4½ m. w.s.w. of St. Paul's. The river is here crossed by a fine iron bridge. Pop. '81, 366,516. Many of the nobility and gentry formerly resided at C., and some of its coffee-houses were much resorted to by pleasure-parties in the 17th and 18th centuries. C. has water-works to supply London, a chain-pier, and floor-cloth factories, besides a training-college for male and another for female teachers, and the Cremorne house gardens, now a place of public amusement.

CHELSEA HOSPITAL is an asylum for disabled or superannuated soldiers. The building was commenced in 1609, as a Protestant theological seminary, by Dr. Matthew Sutcliffe, dean of Exeter; and James I. gave it a charter in 1610, as *King James's college.* When Sutcliffe died in 1629, the building was less than half finished, and the students were only 15 in number. Shortly after this, the scheme was abandoned, and the building used for various purposes. It was then rebuilt, and made into an hospital for disabled soldiers by Charles II. By a warrant issued in 1684, one day's pay per year, and two in leap-years, were deducted from soldiers' pay, for supporting C. H. This deduction has long ceased; the hospital being maintained by parliamentary grant. The hospital has accommodation for about 600 persons besides officers. Attached to it are about 40 acres of land, used as public gardens and exercise ground. It is governed by a board of commissioners, comprising *ex officio* the lord president of the council, the first lord of the treasury, and the secretaries of state; but the more immediate management is in the hands of about 120 persons, of whom 20 are military officers, 20 civil officers, and the rest subordinates.

The establishment is maintained for the *in-pensioners* of the British army, who, in the army estimates for 1876–77, are set down at 538. These in-pensioners, besides board, lodging, clothing, washing, medical aid, etc., receive a small sum in money, varying from 5*s.* 3*d.* per week for a color-sergeant, down to 7*d.* per week for a private soldier. They are all dressed in uniform—red, with blue facings—and are treated as a garrison, in respect to guards, sentinels, etc. There is a certain degree of choice open to the men, as to whether they will be *in* or *out* pensioners. The out-pensioners, who are more than a hundredfold as numerous as the others, receive sums of money varying from 1½*d.* to 3*s.* 10*d.* per day for life, as a reward for past services. Vacancies in the hospital are filled up once a quarter; and every person admitted must give up his out-pension before he can become an in-pensioner. The cost of the hospital for 1876–77 was estimated at £28,916. This is exclusive of *out*-pension charges. Doubts have frequently been expressed as to the usefulness of this expenditure; it is exceptional in its character, and the arrangement to which it refers is not in much favor among the soldiery.

CHELTENHAM, a t., parliamentary borough, and fashionable watering-place, in the co. of Gloucester, 8 m. n.e. of Gloucester. It lies in a picturesque and healthy valley on the Chelt, a small stream which rises in the adjacent hills, and flows into the Severn. It is sheltered on the e. and s.e. by a semicircle of the Cotswolds. It owes its celebrity and rapid increase to its mineral springs, of which there are several varieties. The chief street is upwards of a mile long, right and left of which are spacious and elegant squares and crescents, and innumerable villas lately erected for the accommodation of the numerous visitors. Attached to the spas are handsome pump-rooms—with tasteful grounds, avenues, saloons—lodging-houses, and public promenades among the finest in England, besides many fine mansions in and around the town. It has 10 churches and a number of dissenting chapels. Of late years, C. has become famous for its public schools, the oldest of which is its endowed grammar-school, capable of educating 300 scholars; but the largest, and now the most celebrated, is its proprietary college, for the sons of gentlemen, a noble institution, educating, upon an average, 600 pupils. There are also a ladies' college, a junior proprietary school, and a number of private scholastic establishments. There are public assembly-rooms in the town; which is also much resorted to in winter for its hunting. I thas two clubs, and five or six weekly newspapers. Pop. '81, 46,844. C. returns one member to parliament. Its affairs are managed by a board of elected commissioners. It has no manufactures of any importance. C. was only a village in 1716, when the first spring was discovered. It gradually increased till 1788, when the benefit received by George III. from its waters suddenly made it a resort of fashion.

CHEM'IC, is the name given to BLEACHING POWDER by those engaged in chemical works.

CHEMICAL NOMENCLA'TURE AND NOTA'TION. (During the progress of the *Encyclopædia,* the nomenclature and notation of chemistry were greatly changed. What follows here is allowed to stand, as the old names and notation are still found in books in use, and are often used concurrently with the new.) In early times, chemical substances were named according to the fanciful theories of alchemy (q.v.) Thus the name *flowers*

of sulphur was applied to the sublimed sulphur, which grew or sprang like a flower from sulphur when heated; *spirit of salt*, to hydrochloric acid, the corrosive acid or spirit obtained from common salt; and a multitude of other names had a like fanciful origin. In 1787, Lavoisier founded the system of nomenclature which is followed still by chemists. At first, it was intended that the names of simple as well as compound substances should be regulated by system. Hence, such terms as oxygen (from *oxus*, acid, and *gennao*, to produce), *the acid-producer*, given from the notion then held that no acid was without oxygen; and hydrogen (from *hydor*, water, and *gennao*), *the water-producer*, from the supposition that hydrogen had more to do with the formation of water than any other element. The advance of chemistry, however, has so completely changed the opinion of chemists regarding the simpler bodies, that such names are now found to mislead; and thereafter, though such as had been given on this system were retained, their meaning has been discarded, and the systematized nomenclature restricted to compound substances. A remnant of the system, however, still subsists at the present time, in making the scientific names of all the metals end in *um*. In the non-metallic elements, a close analogy exists between chlorine, bromine, iodine, and fluorine; and to indicate this, the common termination *ine* has been given; and for a similar reason, carbon, silicon, and boron, end in *on*. As a general rule, however, the chemical name of an elementary substance does not convey any scientific meaning, and must be regarded as a simple mark or designation, analogous to the names of persons, which give no notion regarding their moral character or physical development. The ancient and more common metals retain their popular titles, such as gold, silver, and copper; but the more recently discovered metals have names given which end in *um*. The symbol of an element is obtained from the first letter of its Latin name, as O for oxygen; Pl for lead (Lat. *plumbum*). When the names of two or more elements commence with the same letter, a smaller letter or satellite is attached to one or more of these; such as S for sulphur, Se for selenium, and Si for silicon. For a complete table of the symbols of the elementary substances, see Atomic Weights.

The name of a compound substance generally indicates the elements of which it is composed. Thus the name oxide of iron indicates that the red powder (rust) is made up of oxygen and iron; the sulphuret of lead (galena), that it is composed of sulphur and lead. In all similar combinations—

Oxygen forms oxides.
Chlorine " chlorides.
Bromine " bromides.
Iodine " iodides.
Fluorine " fluorides.
Nitrogen " nitrides.
Carbon " carbides or carburets.
Sulphur " sulphides or sulphurets.
Selenium " selenides or seleniurets.
Phosphorus forms phosphides or phosphurets.

When two elements combine with each other in more than one proportion or equivalent (see Atomic Theory and Atomic Weights), the names of the compound bodies are contrived so as to express this. The term *proto*xide is applied to a compound of one equivalent of oxygen with one equivalent of another element; *deuto*xide to a compound containing a larger proportion of oxygen than the protoxide; and *trito*xide when the oxygen is still further increased. The term *bino*xide is used when oxygen is present in the proportion of two equivalents to one equivalent of the other element; and *tero*xide when the proportion is as three to one. A *sub*oxide contains less than one equivalent of oxygen; and a *per*oxide is the highest oxide not possessing acid properties. The same prefixes are applied to the compounds of chlorine, sulphur, etc.

When one element combines with another to produce several compounds possessing acid properties, various terminations are employed to distinguish the compounds. Thus, oxygen combines with a number of the elements to produce with each a series of acid compounds, the more *highly* oxidized of which receive the termination *ic*, whilst those containing *less* oxygen end in *ous*. Thus, sulphur*ic* acid contains three equivalents of oxygen to one equivalent of sulphur; and sulphur*ous* acid, two equivalents of oxygen with one equivalent of sulphur. These terminations are qualified by the use of the prefixes *hypo* (under) and *hyper* (over). Thus, *hypo*sulphur*ic* acid is applied to a compound containing less oxygen than the sulphur*ic* acid, and *hypo*sulphur*ous* to one with less oxygen than sulphur*ous* acid.

When acids combine with bases or metallic oxides to form salts, they produce compounds, the names of which are influenced by the terminations of the acids. Thus, sulphur*ic* acid and soda form the sulph*ate* of soda; sulphur*ous* acid and soda, the sulph*ite* of soda; and *hypo*sulphur*ous* acid and soda, the *hypo*sulph*ite* of soda. In the same manner, nitr*ic* acid with potash forms the nitr*ate* of potash, whilst nitr*ous* acid and potash produce the nitr*ite* of potash.

If a symbol be employed alone, it represents one equivalent of the element. Thus, O signifies one equivalent, or eight parts by weight, of oxygen; C, one equivalent, or six parts by weight, of carbon; H, one equivalent, or one part by weight, of hydrogen. The

combination of two elements is represented by placing the symbols for those elements side by side; thus, HO signifies one equivalent of hydrogen and one equivalent of oxygen in a state of chemical combination (viz., water); and NaCl is one equivalent of sodium (Lat. *natron*) united with one equivalent of chlorine (viz., common salt).

When two or more equivalents of one element unite with one or more equivalents of another element, the number of such equivalents is signified by a small figure being placed immediately after the symbol of the element so multiplied. Thus, HO_2 represents one equivalent of hydrogen in combination with two equivalents of oxygen (peroxide of hydrogen); MnO_2 is one equivalent of manganese with two of oxygen (black oxide of manganese); Fe_2O_3 is two equivalents of iron with three equivalents of oxygen (rust); and Pb_3O_4 is three equivalents of lead with four equivalents of oxygen (red lead).

In expressing the formula of a compound substance, the symbol of the metal or its analogue is placed first in order, and is succeeded by the oxygen, chlorine, or similar element. Thus, the symbol for the chloride of mercury is always written HgCl, never ClHg. The same order is carried out in the construction of the formula of more complex substances; the metallic half is placed first. Thus, sulphate of iron—containing sulphuric acid and the oxide of iron—is always expressed as FeO,SO_3, never SO_3FeO. In other words, the symbols are written in the order in which the substances would be named in Latin.

In the construction of the formulas of complex substances, the comma (,) and *plus* sign (+) are often introduced; the former to separate the symbols of substances which are closely united together, and the latter to form a line of demarcation where the components are less intimately combined. Thus, $FeO,SO_3 + KO,SO_3$ represents the compound of the sulphate of iron with the sulphate of potash; $KCl + PtCl_2$ is the double chloride of potassium and platinum.

Large figures placed at the left hand of a formula multiply all the symbols till a comma or plus sign appears. Thus, $3SO_3$ represents three equivalents of sulphuric acid; $3PbO,\overline{A}$ is three equivalents of oxide of lead, and one equivalent of acetic acid; and $KO,SO_3 + Al_2O_3,3SO_3 + 24HO$ (alum) is one equivalent of the sulphate of potash, with one equivalent of the sulphate of alumina, and 24 equivalents of water. When a compound substance requires to be multiplied, it is inclosed within parentheses, and a large figure placed immediately before it; thus $3(KO,C_2O_3) + Fe_2O_3,3C_2O_3 + 6HO$ represents three equivalents of oxalate of potash, one equivalent of oxalate of iron, and six equivalents of water.

In expressing the formulas of organic compounds, the symbols are written in the following order: CHNO. Thus, turpentine is C_5H_4, alcohol is $C_4H_6O_2$, and morphia is $C_{34}H_{19}NO_6$.

Arbitrary symbols are occasionally used to represent important complex substances. Cyanogen is known as Cy; the organic acids are recognized by their initial letter with the sign (—) drawn above, as $\overline{T}$ for tartaric acid, $C_8H_4O_{10}$; $\overline{A}$ for acetic acid, $C_4H_3O_3$; and $\overline{O}$ for oxalic acid, C_2O_3; while the alkaloids are represented by their initial letter or letters with the sign (+) above; thus, $\overset{+}{S}r$ for strychnine, $C_{42}H_{22}N_2O_4$; $\overset{+}{M}o$ for morphia, $C_{34}H_{19}NO_6$; and $\overset{+}{Q}$ for quinine, $C_{40}H_{24}N_2O_2$.

Occasionally, in treatises on mineralogical chemistry, arbitrary modes of expressing the composition of minerals are resorted to, which it is not necessary here to explain.

CHEMICAL TOYS, which in the course of recent years have been brought prominently before the public, deserve a brief notice. "Pharaoh's serpents," which are described in the article SULPHOCYANOGEN, are highly poisonous, and during combustion evolve dangerous vapors. *Larmes du Diable*, or "crocodiles' tears," are formed of metallic sodium, burn with extreme violence if thrown into water, or even if moistened with water or heated, and scatter particles of caustic alkali, which may inflict serious burns. "Sunshine in winter evenings," "fiery swords," etc., are formed of magnesium, and, like the preceding, may cause serious burns. Pyroxylin, which is identical with gun-cotton, is the active agent in the various toys known as "will o'-the-wisp paper," "parlor lightning," "fireflies," etc. The use of these toys in teaching rudimentary chemistry to children and young persons is quite incommensurate with their danger.

CHEMISTRY is that branch of natural science which takes cognizance of the changes that bodies undergo when they are influenced by affinity (q.v.). Changes that do not alter the nature and properties of substances—such as the falling of a body by gravity, or its expansion by heat—belongs to physics or natural philosophy. In chemical changes, again, the properties of the substances are permanently altered. Thus, when a piece of iron is left exposed to damp air, it is after a while converted into a reddish brittle substance (rust), owing to the union with it of the oxygen of the air. Chemistry, then, may be most simply defined as that branch of natural science which considers (1.) The combination of two or more substances to form a third body, with properties unlike either of its components; and (2.) The separation from a compound substance of the more simple bodies present in it: and considering that the steps of the combination and decomposition of substances can never be correctly understood without an intimate

knowledge of the properties of substances, it follows that the science of C. must likewise take into notice the description of all the simplest as well as the most complex bodies. See ELEMENTS, CHEMICAL.

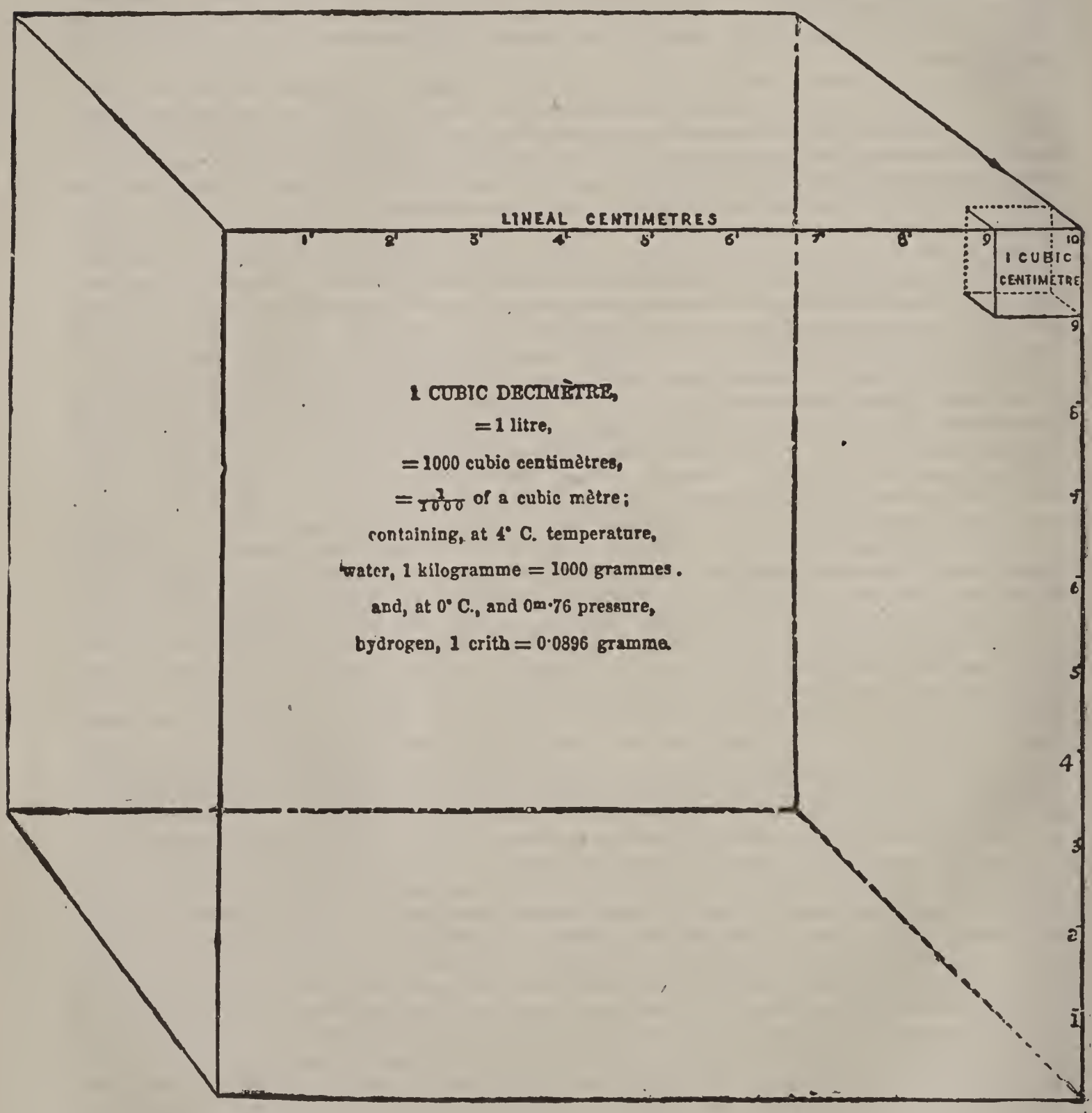
When the science of C. is considered as a whole, including the properties of all the elements or substances, and the combinations and changes which they can under all circumstances undergo, it is distinguished by the title of *pure, theoretical,* or *philosophical C.* Particular departments of C., where the science is confined to the examination of special objects, receive distinctive names; as *physical C.*, or *chemical physics*, which considers phenomena bordering on natural philosophy and C.; *mineralogical C.*, which takes cognizance of the composition of minerals; *physiological C.*, which includes the changes which food undergoes in its transit through the animal economy, and the transformations that take place in organic substances generally; *medical C.*, which considers the composition and compounding of medicines; *agricultural C.*, which relates to the composition of soils and manures, the ingredients in plants, and the best modes of supplying the food they require, etc. *Inorganic C.* takes cognizance of dead matter, and the changes it undergoes, whilst *organic C.* considers the substances obtained from plants and animals.

C. ranks as one of the arts as well as one of the sciences, and the division of *practical C.* comprehends the rules and processes which must be followed, and the mechanical means which must be resorted to, for the successful prosecution of the art. Practical C. is subdivided into *analytical C.* (q.v.), which is occupied with the separation of simple substances from more complex—as chlorine (Cl) and sodium (Na) from the chloride of sodium or common salt (NaCl)—and to the estimation of the quantities of the several ingredients; and *synthetical C.*, which has for its object the union of simpler bodies to form more complex—as hydrogen (H) and oxygen (O) to form water (HO). The art of *assaying* (q.v.) is a department of analytical chemistry. *Applied C.* includes the art of manufacturing the various substances employed in commerce and in domestic life, so far as chemical processes and application are required. It is subdivided into *technical C.*, which relates to everything connected with the arts and manufactures; and *pharmaceutical C.*, which takes cognizance of the substances used in medicine.

History.—The Egyptians appear to have possessed the greatest amount of chemical knowledge of all the nations of antiquity. They preserved dead bodies from decay (see MUMMY), fixed colors in silk by means of mordants, prepared many medicines and pigments, as also soap, beer, vinegar, metals and metallic alloys, common salt, vitriol, soda, sal-ammoniac, glass, enamel, tiles, and painted earthenware. The Chinese were very early acquainted with the processes for dyeing, and the preparation of metallic alloys, the fabrication of niter, sulphur, gunpowder, borax, alum, porcelain, verdigris, paper, etc. From the Egyptians, the Greeks and Romans derived what chemical knowledge they possessed; but they added little or nothing; and when the migration of the northern tribes, and overthrow of the Roman empire, took place, a stop was put for a time to the advancement of all science in Europe. The prosecution of chemical knowledge was taken up by the Arabs before the 8th c., and was carried on by them and by their European scholars, the alchemists, with the results described under ALCHEMY. The first germs of a real science of C. seem to appear about the end of the 17th and beginning of the 18th c., in the speculations of Becher (q.v.) and the phlogistic theory of Stahl (q.v.). After this, C. rapidly advanced. In 1718, Geoffrey brought out the first table of *affinities;* in 1732, Boerhaave published many original experiments on the chemical relations of heat and light; in 1724 Hales, and in 1756 Black, published researches on the air and aëriform bodies, showing that the carbonic acid evolved during fermentation, respiration, and by the action of acids on chalk, was different from atmospheric air. In 1754–59, Margraff added to the then known earths—lime and silica—two others, alumnina and magnesia; he also extracted sugar from plants. In 1770, Priestley began to announce his discoveries of oxygen, ammoniacal, hydrochloric, and sulphurous acid gases, etc. In 1773–86, Scheele contributed chlorine, hydrofluoric, prussic, tartaric, and gallic acids; also baryta, phosphoric acid from bones, etc., and gave the first hints regarding a new doctrine of combustion. About the same time Bergman and Cavendish enlarged our knowledge of the gases. Lavoisier, between 1770 and 1794, reorganized much of the then known C., and founded a system of C. which still remains as the skeleton of the science. Berthollet, in 1787, contributed much to the doctrine of affinity, and made researches in chlorine, etc. Fourcroy and Vauquelin advanced organic C.; Klaproth gave many contributions to mineral C. Richter devoted himself to the doctrine of combining proportion, which was afterwards perfected by Dalton, as noticed under atomic theory (q.v.). The discovery of galvanic electricity by Galvani, and its advancement by Volta, led sir Humphry Davy, and others, to important researches in the metals and gases. Gay Lussac and Thenard advanced our knowledge regarding organic substances and the chemical relations of heat. Berzelius made laborious researches in mineral C., and gave an exactness to this department which is matter of astonishment to the chemists of the present day. He was also the author of the electro-chemical theory, which has been almost perfected by the labors of Faraday, De la Rive, Becquerel, etc. Organic C. has latterly advanced most rapidly under the researches of Liebig, Wohler, Mitscherlich, Mulder, Laurent, and others. See ATOM, ATOMIC THEORY, ATOMIC VOLUME, ATOMIC WEIGHTS, AFFINITY : also the next article.

CHEMISTRY. It is impossible in this article to do more than briefly describe some of the most important of the numerous changes which have been introduced into the science of chemistry within the last few years.

1. The system of measuring temperature, lengths, weights, and volumes has been altered. The centigrade has completely superseded the Fahrenheit thermometric scale in all recent chemical works, and the French metric (which is a decimal) system has been adopted for all measurements and weights, inches and their fractions being replaced by 10ths or 100ths of a meter, and grains by grams. It has this advantage over all the other systems, of possessing one fundamental linear unit, from which all the ramifications of linear, superficial, or solid dimensions, and of weight are derived. See METER, LITER, GRAM, FRANC. This unit is the 10-millionth part of a quadrant of the meridian, or of the distance from the pole to the equator. It is only to measures of weight and capacity or volume that we need here refer. "*Multiply,*" says Dr. Hof-



man in his energetic appeal in favor of the metric system, "the cubic meter by one million, and you have a fit measure in terms of which to express the *capacity* of the Atlantic, or its *cubical contents* of brine; *divide* the cubic meter by one million, and you arrive at the petty volume of the gambler's ordinary die."—*Modern Chemistry*, p. 124. This last-named volume, the millionth of a cubic meter, taken as so much distilled water at a temperature of 4° C. (its point of greatest density), furnishes the metrical *unit of weight* called the *gram*, which thus forms a link connecting weight with measure. Again, dividing the edge of a *meter cube*, which is a linear meter, into 10 parts, called *decimeters*, and cubing one of these parts, we obtain a unit of volume or capacity to which the term *liter* is applied. The various weights in use are all multiples or divisions by tens. Thus, 10 meters form a decameter, 100 a hectometer, and 1000 a kilo-

meter; while $\frac{1}{10}$th of a meter is called a decimeter, $\frac{1}{100}$th a centimeter, and $\frac{1}{1000}$th a millimeter, the Greek prefixes in all cases denoting multiplication, and the Latin division. The reader will do well to recollect the following rough comparisons between the chief French and English measures chiefly used in chemistry, as otherwise he can form no conception of the length, size, or weight of the substances treated of. A meter = nearly 1.1 linear yard = 39.37 in.; a millimeter = 0.039, or nearly $\frac{1}{25}$th of an in.; a centimeter = 0.39, or nearly $\frac{2}{5}$th of an in.; and a decimeter = 3.94, or nearly 4 in.; a gram = 15.43 gr.; and a liter = rather more than 61 cubic in., or a pint and three-quarters. The accompanying figure represents a cubic decimeter. Two of the edges of the front side are divided, as may be seen, into 10 linear centimeters; and the space occupied by a cubic centimeter is shown on the upper right-hand corner of the tube. Now, a cubic decimeter is employed as a unit for measures both of weight and of volume, for in the former capacity it contains, at 4° C., 1 kilogram, or 1000 grams of distilled water, and in the latter it loses its name of kilogram and receives the appellation of *liter*, which corresponds to 1000 cubic centimeters, or $\frac{1}{1000}$th of a cubic meter. Chemists have long felt the want of an appropriate *volume*, with its corresponding weight, to serve as standard units of measurement, and prof. Hofman has selected 1 cubic decimeter = 1 liter, as the most appropriate unit of volume, and the weight of this measure of pure hydrogen as the unit of weight, hydrogen being taken at 0° C. temperature, and $0^{m}76$* pressure. To this standard *weight-unit*, which = 0.0896 of a gram, he assigns the name of *crith*, from the Greek *krithé*, a barley-corn, signifying figuratively a small weight; and the weight is now in universal acceptation amongst modern British chemists. There is probably no figure in chemical science more important than this one (0.0896 of a gram) to be remembered and kept ready for calculation; for it is the standard multiple or co-efficient by means of which the weight of 1 liter of any other gas, simple or compound, is computed. "For example, the relative volume-weight of chlorine being 35.5, that of oxygen 16, and that of nitrogen 14, the actual weights of 1 liter of each of these elementary gases at 0° C. and $0^{m}76$ pressure, may be called respectively 35.5 *criths*, 16 *criths*, and 14 *criths*. So again with reference to the compound gases, the relative volume-weight of each is equal to half the weight of its product-volume. Hydrochloric acid (HCl), for example, consists of 1 volume of hydrogen + 1 volume of chlorine = 2 volumes, or by weight, 1 + 35.5 = 36.5 units; whence it follows that the relative value-weight of hydrochloric acid gas is $\frac{36.5}{2}$ = 18.25 units; which last figure therefore expresses the number of *criths* which 1 liter of hydrochloric acid gas weighs at 0° C. and $0^{m}76$ pressure, $18.26 \times 0.0896 = 1.6352$ as the actual weight in grams of hydrochloric acid gas. Again, as the product-volume of water gas (H_2O),† taken at the above temperature and pressure, contains 2 volumes of hydrogen + 1 volume of oxygen, and therefore weighs 2 + 16 = 18 units, the single volume of water-gas weighs $\frac{18}{2}$ = 9 units, or substituting as before the concrete for the abstract value, 1 liter of water-gas weighs 9 *criths;* that is to say, 9×0.0896 gram = 0.8064 gram."—*Op. cit.* p. 131. In concluding this subject we will only further remark, that when a closely approximative result suffices, the crith may be estimated at 0.09 gram.

2. Such terms as *atomic weight*, *atom*, and *molecule* are now employed in a stricter sense than formerly. Every element has been held from the time of Dalton to have a number called its atomic weight. This number, according to Dr. Frankland, one of our most distinguished modern chemists, is made to represent, as far as possible: 1*st*, The smallest proportion by weight in which the element enters into or is expelled from a chemical compound—the smallest weight of hydrogen so entering or leaving a chemical compound being taken as unity. 2*d*, The weight of the element in the solid condition at any given temperature contains the same amount of heat as seven parts by weight of solid lithium at the same temperature. 3*d*, The weight of the element which, in the form of gas or vapor, occupies, under like conditions of temperature and pressure, the same volume as one part by weight of hydrogen."—*Lecture Notes for Chemical Students*, 1866, p. 2. Recent investigations have led chemists to assign to many of the elements double the atomic weights that were previously assigned to them.‡ Thus, taking as formerly the atomic weight of hydrogen as the unit, the atomic weight, or, as it is now often styled, the *atomic number* of oxygen is changed from 8 to 16, that of carbon from 6 to 12, that of sulphur from 16 to 32; and this doubling is by the latest writers extended to most of the elements except the halogens, nitrogen, phosphorus, boron, the metals of the alkalies, gold, and silver. The old atomic weights are still recognized as *combining* or equivalent numbers. The reason why this doubling of the number has been adopted will be presently given. The distinction between an *atom* and a *molecule* must be clearly recognized. "We may define an *atom* of an elementary body to be the smallest proportional weight thereof which is capable of existing

* It is almost unnecessary to notice that $0^{m}76$ signifies 0.76 of a meter, or nearly 30 inches--the ordinary atmospheric pressure at the level of the sea, and at lat. 51½°.

† The reason why the formula H_2O, instead of HO, for water is used, will be presently explained.

‡ The article "Atomic Theory" in the body of the work has been rewritten in accordance with the new views.

in *chemical combination;* and we may define the *molecule* of an elementary body to be the smallest proportional weight thereof which is capable of existing in the *free or uncombined state.*" This, which is Hofman's definition (*Modern Chemistry,* p. 157), is now generally accepted. Thus a molecule (or *elementary molecule,* as it is often termed) may consist either of an isolated atom, or of a group of atoms.

The bulk of a molecule, or the *molecular volume* of an element in the gaseous or vaporous state, is the same as the molecular volume of hydrogen at the same temperature and pressure, and in a large number of cases the *molecular weight* of an element is twice its atomic weight. Dr. Frankland gives the following list of the elements whose molecular volumes have as yet been determined: The molecules of mercury, cadmium, and zinc contain *one* atom, and are termed *monatomic molecules;* those of hydrogen, oxygen, chlorine, bromine, iodine, fluorine, nitrogen, sulphur, and selenium contain *two* atoms, and are termed *diatomic molecules;* the molecules of oxygen, as ozone, contain three atoms, or are *triatomic;* while those of phosphorus and arsenic are *tetratomic*, and those of sulphur under certain conditions are *hexatomic.* Thus an element, as in the cases of oxygen and sulphur, may, under different conditions, have two distinct molecular weights.

3. We shall now proceed to explain the reasons why many of the atomic weights have been doubled. "It is obvious," says Dr. Odling, in his elaborate article on "Atomic Weights" in Watts's *Dictionary of Chemistry,* vol. i. p. 456, "that the atomic weights of an element and of its combinations should be selected so as to express the entire series of combinations by the simplest series of formulæ; so as best to accord with the chemical properties and metamorphoses of the bodies; so as best to illustrate their analogies with other bodies; and so as to be in relation with their physical properties, such as their specific volumes, specific heats, isomorphism, etc." We shall endeavor to show how he applies these views to prove that, in the case of oxygen, 16 parts of that element, or the quantity thereof which unites with 2 atoms of hydrogen, is the smallest proportion of oxygen that can enter into a combination. "We find, in the first place," says Dr. Odling, "that the quantity of oxygen contained in the great majority of definite oxidized compounds must necessarily be represented by 16, or some multiple of 16 parts. Thus, the molecules of all hydrates, double oxides, acids, oxisalts, aldehydes, ketones, alcohols, oxacid-ethers, and a great number and variety of other compounds, doubtless forming together 99 per cent of all known compounds of oxygen, cannot be represented save with 16 parts, or some multiple of 16 parts of oxygen. For example, the molecules of *hydrate of potassium,* benzoic aldehyde, acetone, chloral, hypochlorite of sodium,** etc., each contain 16 parts of oxygen. The molecules of *spinelle, brown hæmatite, camphor, benzile, acetate of sodium,* benzoic acid*, etc., each contain twice 16 parts of oxygen. The molecules of *nitric acid, glycerin, chlorate of potassium,* salicylic acid, augite,* etc., each contain three times 16 parts of oxygen. We need not carry the quotation further, it being sufficient to remark that Dr. Odling gives similar lists of substances whose molecules each contain 4, 5, 6, 7, etc., times 16 parts of oxygen. Hence it follows that when two bodies only differ in composition by the different proportions of oxygen which they contain, that difference amounts to 16 parts, or some multiple of 16 parts of oxygen. This is well shown in the two following series of bodies given by Odling, in the former of which the symbols are arranged according to modern views:

KCl,	Chloride of potassium.	C_4H_4,	Ethylene.
$KClO_2$,	Hypochlorite of potash.	$C_4H_4O_2$,	Aldehyde.
$KClO_4$,	Chlorite of potash.	$C_4H_4O_4$,	Acetic acid.
$KClO_6$,	Chlorate of potash.	$C_4H_4O_6$,	Glycolic acid.
$KClO_8$,	Perchlorate of potash.	$C_4H_4O_8$,	Glyoxylic acid.

It is obvious that in both these series each term differs from the preceding one simply by O_2, or 16 parts of oxygen. Again, the quantity of oxygen which can be liberated by any reaction, and which, either alone or in the form of water, can be added to or separated from a compound, must be 16, or some multiple of 16 parts. Thus, each molecule of nitrate of soda (NaO,NO_5), when decomposed by heat, yields nitrate of soda (NaO,NO_3) and O_2 (or 16 parts of oxygen); similarly, each molecule of permanganate of potash, when decomposed by sulphuric acid, yields manganese—alum, and O_4 (or twice 16 parts of oxygen); and each molecule of chlorate of potash (KO,ClO_5) is decomposed by heat into chloride of potassium (KCl) and O_6 (or three times 16 parts of oxygen). Again, water (and consequently its main constituent, oxygen) is always eliminated in double or some higher even atoms. Thus, formic acid ($C_2H_2O_4$) yields carbonic oxide (C_2O_2) and two atoms of water (H_2O_2); alcohol ($C_4H_6O_2$) yields olefiant gas (C_4H_4) and two atoms of water (H_2O_2); oxalate of ammonia (NH_3,C_2HO_4) yields cyanogen (C_2N) and four atoms of water (H_4O_4); and innumerable additional examples might be given. On these grounds (and many additional ones might be adduced if space permitted) it becomes obvious that if the vast majority of oxidized bodies were correctly formulated, they would be represented more simply

* In these cases, one of the new forms of nomenclature is introduced.

by the formulæ in which O = 16 than by the formulæ in which O = 8. Reasons of a similar nature have led to the duplication of the atomic weight of carbon, sulphur, and many of the other elements. There must obviously be some means of distinguishing when O indicates 8 or 16 parts of oxygen, C indicates 6 or 12 parts of carbon, etc. Various modes of distinction have been adopted by different chemists. In Watts's *Dictionary of Chemistry* (published between 1863 and 1868), the new atomic weights are represented by the same symbols which have hitherto been adopted for the old weights; while the latter (when they are occasionally introduced) are printed in italic capitals; thus water is represented by H_2O in the new and by *HO* in the old system, acetic acid by $C_2H_4O_2$ in the new and by $C_4H_4O_4$ in the old system, etc. A more common means of indicating when the value of the symbol of an element is doubled in value is by drawing a horizontal bar through it, a notation due to Berzelius; thus, C̶,O̶,S̶ represent respectively an atom of carbon, of oxygen, and of sulphur in the new system. This system is useful in forming, as it were, a bridge to facilitate the passage from the old to the new system, and will gradually disappear when all chemists recognize the doubled atomic weights. Naquet, Miller (in the 3d edition of his *Chemistry*, 1864), and others, adopt this *barred* system, and the latter frequently gives the formulæ pertaining to both systems; for example, FeO,SO_3HO_3,6HO, or F̶e̶ S̶O̶$_4$ H_2O̶,6H_2O̶, represents the composition of the crystallized sulphate of protoxide of iron often described as protosulphate of iron.—*Inorganic Chemistry*, 3d ed., p. 6. Some writers, as Frankland, in his *Lecture Notes for Chemical Students*, 1866, following the plan of Watts and the contributors to his dictionary, unreservedly adopt the doubled atomic weights, and represent them by the old formulæ; thus O, C, and S represent in these works precisely double the weight of oxygen, carbon, and sulphur that these capitals represent in the 1st and 2d editions of Miller's *Chemistry*, Fownes's *Manual of Chemistry*, and other standard works published a few years ago. It is now customary for the writers of chemical papers who object to the barred symbols as being unseemly, to insert at the commencement C = 6, O = 8, or C = 12, O = 16, in order that the reader may be able to recognize which system is adopted.

Chemical Nomenclature is still in an unfinished state. The chemists of all countries are, with one notable exception, agreed as to the names and symbols which should represent the different elements. The French chemists persist in designating nitrogen by the name of *azote*, and of using Az instead of N for its symbol; and in Italy the term *azoto* is still employed, but as it is often coupled with the symbol N, it will probably soon be exchanged for the more general term nitrogen. When the elementary bodies unite together, they form a *binary compound*. The nomenclature of the binary compounds is in a transitional state. The compounds of sulphur with metals used to form *sulphurets*, latterly they have been termed *sulphides*, and now they are denominated after a third fashion; sulphuret of potassium (for example), after having been for some years sulphide of potassium, now being termed *potassic sulphide*. In order to obtain uniformity, the following rule is adopted by the representatives of the modern school. The names of binary compounds are formed from those of their constituents, the English or Latin name of the positive constituent with the terminal *ic* preceding that of the negative constituent, which is made to end in *ide*. Thus: potassium and sulphur form potassic sulphide; sodium and oxygen form sodic oxide (formerly soda or oxide of sodium); silver and chlorine form argentic chloride (formerly chloride of silver); lead and iodide form plumbic iodide (formerly iodide of lead); calcium and chlorine form calcic chloride (formerly chloride of calcium), etc. When the same elements form two compounds, the one which contains the smallest proportion of the negative element is distinguished by changing the terminal syllable of the name of its positive constituent into *ous*, while the terminal *ic* is retained for the compound containing the larger proportion of the negative element. Thus, 1 atom of iron and 1 atom of oxygen form *ferrous oxide* (the old protoxide of iron); 2 atoms of iron and 3 atoms of oxygen form *ferric oxide* (the old peroxide of iron). Sometimes the same elements form more than two compounds with one another, and then the prefixes *hypo* and *per* are employed. When a binary compound contains oxygen, and becomes an acid when made to unite with water, or becomes a salt when united to a base, it is termed an *anhydride* (q.v.) or *anhydrous acid*. Thus 1 atom of carbon and 2 atoms of oxygen form *carbonic anhydride*, formerly known as carbonic acid gas; 1 atom of sulphur and 3 atoms of hydrogen form *sulphuric anhydride*, etc. In a considerable number of cases, the trivial or common name has not been displaced by the new systematic name; thus water, ammonia, hydrochloric acid, phosphureted hydrogen, sulphureted hydrogen, etc., are not as yet replaced by hydric oxide, hydric nitride, hydric chloride, hydric phosphide, hydric sulphide, etc.; and soda and potash are still preferred by some chemists to sodic and potassic hydrates.

The term *acid* was originally applied only to substances which, like vinegar, possessed an acid taste; it is now made to include a large number of compounds which do not possess this property. The most general definition of acids is that of Gerhardt, which is adopted in Watts' *Dictionary of Chemistry*—namely, that "acids are salts of hydrogen." A more intelligible definition to ordinary readers is that which is adopted by Frankland, in which an acid is described "as a compound containing one or more atoms of hydrogen, which become displaced by a metal when the latter is presented to

the compound in the form of a hydrate." Thus, using the new nomenclature and atomic weights, nitric acid and sodic hydrate, yield sodic nitrate and water—

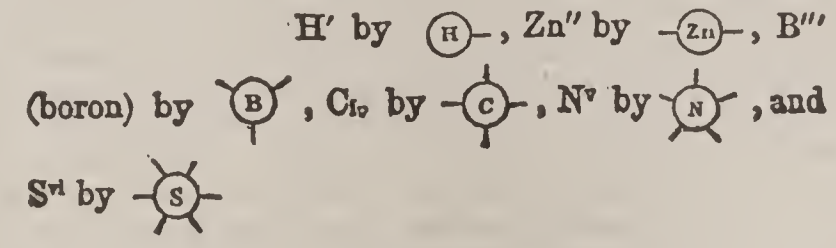
	Nitric acid.		Sodic hydrate.		Sodic nitrate.		Water.
or,	NO_3H	+	NaOH	=	NO_3Na	+	H_2O.

in which reaction the hydrogen of the nitric acid is displaced by the sodium of the sodic hydrate (or soda), and as only *one* atom of hydrogen is displaced, nitric acid is said to be *monobasic*. When an acid admits of the displacement of two atoms of hydrogen, it is termed *dibasic*—as tartaric, oxalic, and, according to recent views, sulphuric acid; and when three atoms can be replaced—as in the case of common phosphoric acid, H_3PO_4, in which H_3 may be displaced by K_3 or Ag_3, the acid is termed *tribasic*. The nomenclature of the compounds of acids with bases is still unfixed. The names of the alkali-metals (potassium, sodium, and lithium) and alkaline-earth metals (barium, calcium, etc.) are now commonly substituted for those of their oxides in the nomenclature of the corresponding oxygen salts—as, for example, *carbonate of sodium* and *sulphate of calcium* for carbonate of soda and sulphate of lime. The names of these bodies are thus brought into uniformity with those of the salts of iron, copper, etc. In Watts' *Dictionary* and Frankland's *Lecture Notes* such compounds are denominated *sodic carbonate, calcic sulphate, sodic nitrate,* etc.; and these terms will doubtless soon be generally adopted for the metallic salts of the oxygen-acids generally. The nomenclature of complex inorganic bodies is founded, for the most part, on the theory of types, the names of particular compounds being obtained from the name of the type by prefixing to it adjectives which express the nature of the element by which the hydrogen of the type is replaced and the number of atoms of it contained in one molecule of the compound. By way of illustration, we give a simple and a complicated example: $Bi\left\{\begin{matrix}Cl\\O\end{matrix}\right.$ = bismuthic oxychloride, while $\begin{matrix}Hg_4\\H_4\end{matrix}\left\{\begin{matrix}Cl_2\\O_2\\N_2\end{matrix}\right.$ = tetramercuro-tetrahydric dioxi-dichloro-dinitride. The nomenclature of organic compounds is founded on the same principles as that of inorganic bodies; but our limited space prevents our entering into this subject.

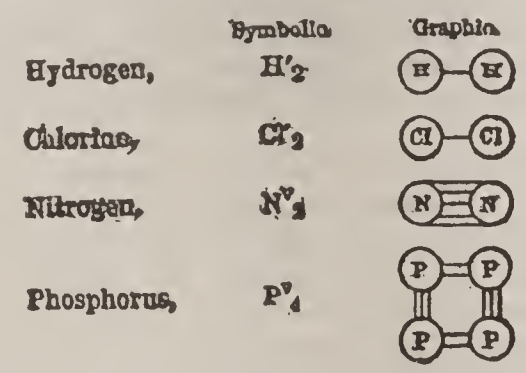
Chemical notation has been considerably altered by certain members of the recent chemical school; but on the whole, the modifications, since the time when the system of Berzelius was introduced into England in the third edition of Turner's *Elements of Chemistry*, are not numerous. The most important are the introduction of "general formulæ" by Gerhardt, in which letters of variable value are used as coefficients instead of numbers, and Odling's method of denoting the atomicity of polyatomic elements and radicals by means of accents placed above the symbols, which are then called dashed symbols. See TRIADS. Chemists are still at variance as to whether, when two or more atoms are represented in a compound, the figure indicating the repetition should be above or below the symbol; whether, for example, water should be represented by H^2O or H_2O, and alcohol by C^2H^6O or C_2H_6O. The *ordinary* or *dualistic* system, according to which the elements combine in couples to form compounds, which similarly unite by twos, led to the division of salts into two classes—viz., into salts composed of an oxygen acid and an oxygen base, which were hence called oxygen salts, as NaO,SO_3, and KO,NO_5, which in the old notation represent sulphate of soda and nitrate of potash; and binary or haloid salts, of which chloride of sodium, NaCl, is the type, which are formed by the union of the radical in hydrogen acids with some metal. Davy considered that the former class might be made similar to the latter by regarding them as composed of a metal and a compound radical having the same electro-negative chemical relations as the radicals in the hydrogen acids. According to this view, a radical, SO_4, not yet isolated, combines with hydrogen to form sulphuric acid, and with a metal to form sulphates, sulphuric acid being represented by H,SO_4, and sulphate of lime by Ca,SO_4. In like manner, nitric acid and the nitrates were supposed to contain a radical, NO_6. Against this view Gerhardt urges that we know nothing of the proximate constitution, but are merely acquainted with the ultimate composition of compounds. Hence we now no longer use a formula for sulphuric acid indicating its supposed constitution (HO,SO_3), but regarding it as a dibasic acid, express it, either as Miller does, by $H_2\overline{SO}_4$, or by H_2SO_4 (where S = 32 and O = 16), or by $\begin{matrix}SO_2\\H_2\end{matrix}\Big\}O_2$, if we adopt the type-notation; and we must not omit that Frankland, who may be regarded as the leading representative of the English school of modern chemistry, represents it by the formula SO_2Ho_2, when Ho is the abbreviated formula for HO, and represents a compound radical, to which he gives the name of hydroxyle, and which is commonly known as binoxide of hydrogen, being expressed, according to the old system, by HO_2. The following examples may enable the reader to pass from one system to another:

	Old System.	Barred System.	New Atomic Weights.	Frankland's Notation.
Sulphate of potassium.....	KO,SO_3	$K_2\overline{SO}_4$	K_2SO_4	$SO_2Ko.$
Sulphate of zinc.....	$ZnO,SO_3.7HO$	$Zn\overline{SO}_4.7H_2O$	$ZnSO_4.7H_2O$	$SOHo_2Zno''.6OH$
Nitric acid.....	HO,NO_5	$HN\dot{C}_3$	HNO_3	$NO_2Ho.$
Nitrate of sodium	NaO,NO_5	$NaN\dot{C}_3$	$NaNO_3$	$NO_2Nao.$

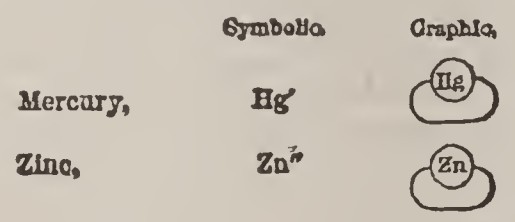
The Ko, Zno″, and Nao in Frankland's notation represent compound radicals, to which he has given the names potassoxyl, zincoxyl, and sodoxyl, and which are represented in the ordinary new notation by KO, ZnO_2, and NaO. These new names will probably soon get into general use in consequence of Frankland's great influence as the teacher of chemistry in the government school of mines, and at the royal institution.* We must refer to the article TRIADS for a description of what is meant by *atomicity*, or, as Hofmann terms it, *quantivalence*, and the reader will do well to study lectures 10 and 11 of his *Modern Chemistry*. In the article just mentioned, we have stated that the degree of atomicity of an element is indicated by the number of dashes with which it is furnished. In the so-called *graphic notation*, which, in the hands of Kekulé, Crum Brown, Naquet, Frankland, and others, has proved a most valuable aid in explanation of the constitution of chemical compounds, the degree of atomicity of an atom is thus expressed·



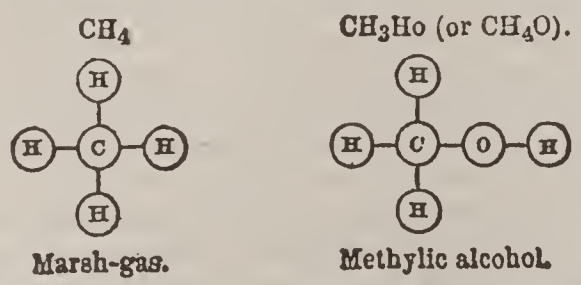
"No element," says Frankland, "either alone or in combination, can exist with any of its bonds disconnected; hence the molecules of all elements with an odd number of bonds are generally diatomic, and always polyatomic—i.e., they contain two or more atoms of the element united together. Thus:



An element with an even number of bonds can exist as a monatomic molecule, its own bonds satisfying each other. Thus:



This graphic notation is most useful in fixing upon the mind the true meaning of symbolic formulæ, and in elucidating the internal arrangement of the very complex molecules which often occur in both mineral and organic compounds. It also affords an easy means of showing the causes of isomerism in organic bodies. The following example will suffice to illustrate our meaning. The simplest of the alcohol family, methylic alcohol, is derived from marsh-gas by the substitution of one atom of Frankland's hydroxyl, Ho or HO (O = 16), for one of hydrogen.



The classification of organic compounds has, during the last few years, been much improved. Until a comparatively few years ago, organic compounds were arranged, according to their most obvious properties, into acids, bases, fatty bodies, etc. Now

* Another peculiarity of Frankland's notation is the introduction of thick letters (Egyptian capitals). His formulæ are so written as to denote that the element represented by the first symbol of a formula, and printed in this type, is directly united by points of attachment or *bonds* with the other elements or compound radicals following the first symbol. Thus, to use his own illustration and notation, the formula SO_2Ho_2 (sulphuric acid) signifies that the hexad atom of sulphur is combined with the four bonds of the two atoms of oxygen, and also with the two bonds of the two atoms of hydroxyl. (By hexad we mean an atom with six bonds, one of which is subsequently figured in the text.)

the great majority of these compounds are arranged in series, of which each group differs from the preceding one by a fixed additional number of certain atoms. Thus (see Armstrong's *Organic Chemistry*, pp. 143, 144) twelve alcohols are represented by the general formula $C_nH_{2n}+_2O$ (new notation), the first being represented by CH_4O, and the others differing from it by an additional number of multiples of CH_2. Bodies of analogous properties thus united are termed *homologous*. Again, every compound in a homologous series yields other compounds differing in composition from that from which they are derived, but yet bearing a different relation to it. Thus, alcohol yields ether, aldehyde, and acetic acid, and these so-called *heterologous* bodies form collateral series. This mode of classification is daily extending. It includes the *organic radicals*, such as methyl, ethyl, allyl, phenyl, cyanogen, etc.; the *hydrides of the compound radicals*, such as methylic hydride or marsh-gas, benzol, cyanic hydride or hydrocyanic acid, etc.; the *alcohols*, which form one of the most important of the families of organic compounds, and which are considered in a special article in this ENCYCLOPAEDIA; the *aldehydes* and *ethers*, both of which are specially described; the *acids*, of which the monobasic acids alone include six series, amongst which are the acetic or fatty series, represented by the general formula $C_nH_{2n}O_2$, and containing 19 or 20 distinct acids, the oleic series, the lactic series, the benzoic or aromatic series, etc.—while the dibasic acids may be divided into four series, in which occur the succinic series, containing nine acids, most of which present several modifications, and the tartaric series; the *anhydrides* (q.v.), of which those belonging to the acetic acid group may be arranged in series; the *ketones* or *acetones;* the compounds of nitrogen containing the *amines*, *amides*, *imides*, etc.; and, in short, excepting the natural alkaloids, the protein-compounds and their derivatives, the uric acid group, pigments, etc., there are few organic compounds which will not soon find a definite place in a series.

In this article we have strictly confined our remarks to the subjects bearing on general, and for the most part on theoretical chemistry. We may, however, allude, in conclusion, to two subjects, which have undergone a great development during the last few years—viz., *volumetric analysis* and the *synthesis of organic bodies*, both of which are discussed in special articles.

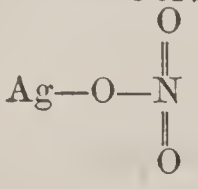
The general tenor of this article shows that chemistry is at present in altogether a transitional state. As prof. Anderson of Glasgow observes in his address to the chemical section of the British association in Sept., 1867, the atomic theory, which, at the commencement of the present century, sufficed to explain all the facts of chemistry that were then known, is now quite inadequate to that end. At that time, chemists were acquainted with comparatively few compounds, and in these, oxygen was of such preponderating importance, that the science might have been almost termed "the chemistry of oxygen." Oxygen is now deposed from its high place, and is supplanted by carbon to such a degree, that one of the first living chemists has actually proposed for organic chemistry the name of "the science of the carbon compounds." Facts gradually accumulated in the course of time which did not admit of explanation on the Daltonian theory; and as their number increased, such terms as catalysis, allotropy, etc., were invented, under which such facts were grouped together as were supposed to depend on similar causes. Such grouping may have certain temporary advantages, provided it is understood that, to use prof. Anderson's words, it is "the grouping of ignorance."

It is indeed obvious that a true theory of chemistry must be a part of a general theory of dynamics, and that until we obtain some more distinct idea of how the atoms are grouped in the molecules of substances (see ATOMIC THEORY) than we at present possess, the link connecting theoretical chemistry and theoretical dynamics is wanting. The doctrine of *atomicity* evidently points to some general truth; it has been of great use in grouping together numerous facts, and in leading to investigations which have resulted in the discovery of many new facts and new generalizations, but we now want an explanation of this doctrine, and this chemistry does not appear to be able to give us. The want of a theoretical explanation does not, however, render a generalization valueless, and much progress has been made of late years in ascertaining the "chemical structure" of substances—that is, in obtaining graphic formulæ, which consistently represent all the reactions by which the substances are formed or transformed. Before discussing the subject of chemical structure, it will be well to consider somewhat more fully than has been done above, the reasons why certain numbers have been selected for the atomic weights of the elements rather than any multiples or submultiples of them (see ATOMIC WEIGHTS). It was pointed out by Dulong and Petit that a close relation exists between the specific heat of a solid elementary substance and its atomic weight. Thus, if we take the old system of *atomic weights* (q.v.), and multiply the specific heat of each solid element by its atomic weight, we find that the elements form three groups. In the first, the product of specific heat into atomic weight, or *atomic heat*, varies from 6 to 6.6. In the second it varies from 3 to 3.3. In the third group, containing the allied elements, carbon, boron, and silicon, no regularity can be traced. By far the greater number of solid elements belong to the first or second group. Now it is plain that the atomic heat of a member of the first group is approximately double that of a member of the second group. But as the atomic weights are to a certain extent arbitrary, we can make the atomic heats of the two groups agree by doubling the atomic weights of the members of the second group. This was first proposed by the eminent Italian chemist, Cannizzaro,

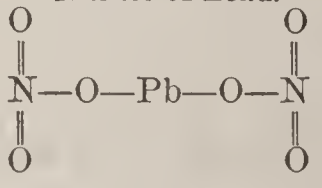
and has now been accepted by most chemists. These new atomic weights not only greatly simplify Dulong and Petit's law, but are also in harmony with many other facts, most of which were observed after the change had been made. Thus the formulæ of corrosive sublimate, bichloride of tin, and zinc methyl are, according to the old system, HgCl; $SnCl_2$; and ZnC_2H_3 and H = 1. According to the new system, they are $HgCl_2$; $SnCl_4$; and ZnC_2H_6.

It will be at once observed that the second set of formulæ represent just twice the quantity represented by the first; now the second formulæ express the *molecular weights* of the substances according to Avogadro's law (see Atomic Theory). Further, if we adopt the old atomic weights, we see no reason why oxide of lead should readily form basic salts, while oxide of silver does not. This peculiarity is to some extent explained by the new atomic weights; thus we have nitrate of silver—old formula $AgNO_6$, new formula $AgNO_3$; nitrate of lead—old formula $PbNO_6$, new formula $Pb(NO_3)_2$; basic nitrate of lead—old formula $PbO,PbNO_6$, new formula $Pb_2O(NO_3)_2$. The contrast will be better seen if we put the new formulæ into a graphic form.

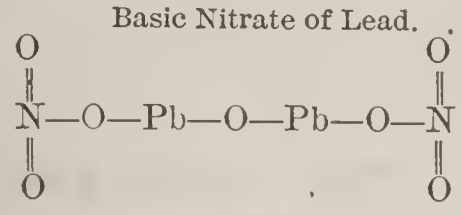
Nitrate of Silver.



Nitrate of Lead.

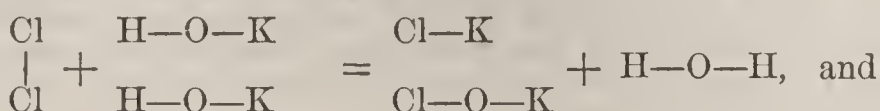


Basic Nitrate of Lead.

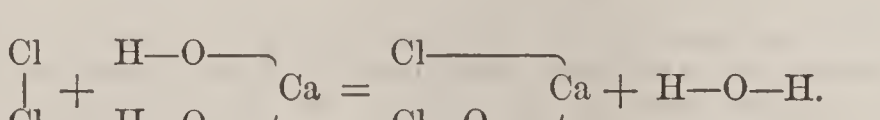


We at once see the connection between the dyad character of lead (—Pb—), and the occurrence of basic salts.

Similarly we know that if we pass a current of chlorine gas into a cold solution of caustic potash, we obtain a *mixture* of chloride of potassium and hypochlorite of potash —$Cl_2 + 2KHO = KCl + KClO + H_2O$. But that if, instead of caustic potash, we take slaked lime, we obtain, not a *mixture*, but a single substance: $Cl_2 + CaH_2O_2 = CaOCl_2 + H_2O$. Putting the new symbols into a graphic form we have:



and

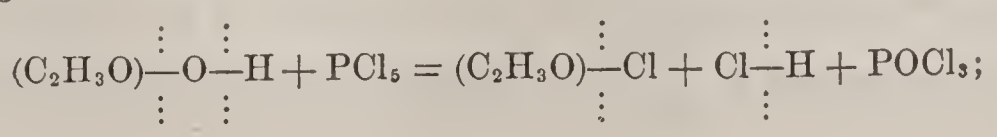


Where we see why we have a mixture in the first case, and a single substance in the second, the reason being that calcium being a dyad, one atom of it represents two atoms of potassium. Many other examples might be given, but these may suffice as an indication of the reasons which have induced chemists to prefer the atomic weights given in the second column in the table in the article Atomic Weights.

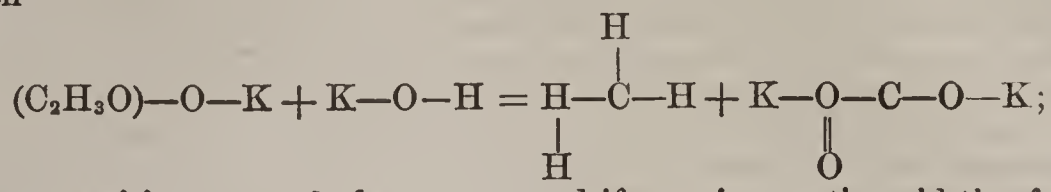
Assuming, then, these atomic weights, let us return to the subject of *Chemical Structure.* This may be defined in various ways, but most conveniently as the indication by a graphic formula, or something equivalent to it, of all the chemical changes by which the substance can be formed or decomposed. This will best be illustrated by means of a few examples, and we shall select these from among organic compounds, that is, compounds of carbon, because the structure of these compounds has been most fully investigated.

Acetic acid has (on the new system, which will be exclusively used in the remainder of this article) the formula $C_2H_4O_2$. If it is treated with caustic potash, it yields acetate of potash according to the equation $C_2H_4O_2 + KHO = C_2H_3KO_2 + H_2O$. Here one atom of hydrogen has been replaced by one atom of potassium, and we find that further treatment with caustic potash does not cause any further replacement of hydrogen by potassium. We may therefore write the formula of acetic acid thus: H—($C_2H_3O_2$), and this formula indicates the replaceability of one atom of hydrogen by metal, and explains (as far as such formulæ can *explain* anything) the occurrence of such compounds as acetate of lead ($C_2H_3O_2$)—Pb—($C_2H_3O_2$), and all the other acetates. The question now remains, what is the structure of the group ($C_2H_3O_2$), which is united in acetic acid to hydrogen, and in the acetates to metal?

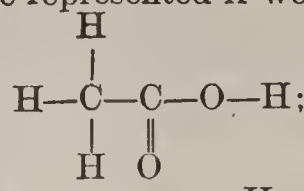
To answer it we must examine some other reactions of acetic acid. When treated with pentachloride of phosphorus, it loses an atom of oxygen, the place of which is taken by two atoms of chlorine—the pentachloride of phosphorus taking the oxygen in exchange for the chlorine; but instead of obtaining a compound ($C_2H_4OCl_2$), we find that the result is expressed by the equation: $C_2H_4O_2 + PCl_5 = C_2H_3OCl + HCl + POCl_3$. We thence conclude that in acetic acid the atom of dyad oxygen removed in the action given above was united to an atom of hydrogen, and to the group (C_2H_3O), and represent the change thus:



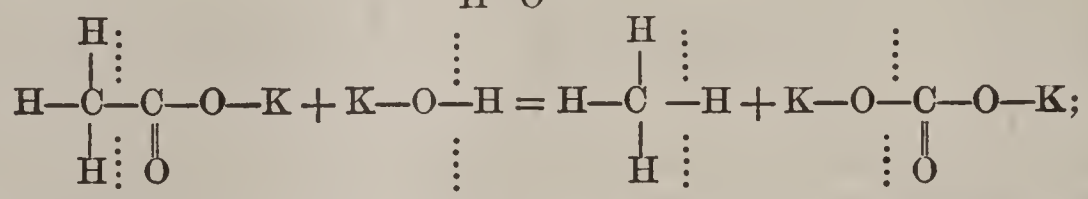
the replacement of the dyad oxygen by two atoms of the monad chlorine necessitating the falling asunder of the compound. The reactions of chloride of acetyl (C_2H_3OCl) lead us to the further conclusion that the atom of hydrogen replaceable by metal is the atom not present in chloride of acetyl, so that the formula $(C_2H_3O)—O—H$ is a fuller and more explanatory form of $(C_2H_3O_2)—H$. Again, if we heat acetate of potash with caustic potash, we have marsh gas (CH_4) given off, and the residue consists of carbonate of potash



and this decomposition can only be represented if we give acetic acid the formula

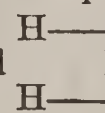


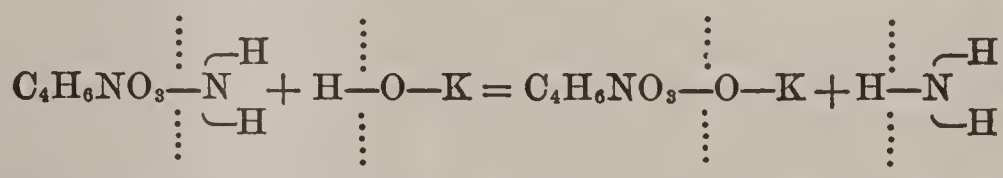
when we have

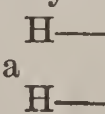


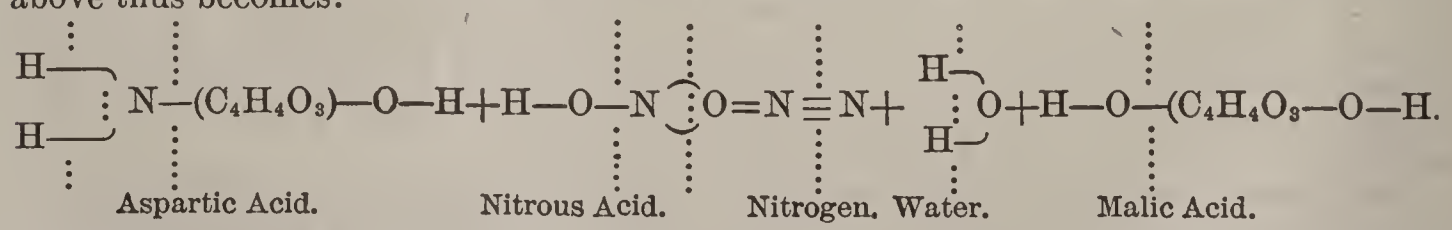
the dotted lines separating in the diagram the symbols of the parts of the molecules which change places.

We have considered only a few of the reactions of acetic acid, but the formula just given is equally consistent with all the others. It is therefore said to exhibit the *structure* of acetic acid. This word "structure" is perhaps a little misleading—we must recollect the precise sense in which it is used, as a concise representation of many reactions. It is conceivable that it may have some relation to the actual relative position of the atoms in a molecule of acetic acid, but we have not as yet any means of ascertaining whether this is so or not.

We may illustrate the meaning of chemical structure further by a somewhat more complex case. Asparagine, a colorless crystalline substance extracted from asparagus, and also from the blanched shoots of other plants, has the composition expressed by the formula $C_4H_8N_2O_3$. When treated with caustic potash it yields ammonia and a body called aspartate of potash—the potash salt of aspartic acid. The change is obviously an exchange of K—O— and  and may be thus indicated:

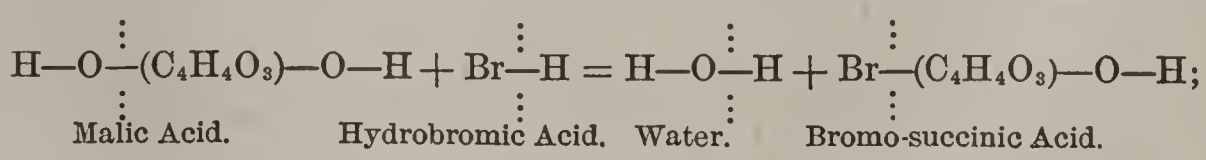


Aspartic acid is then $(C_4H_6NO_3)—O—H$, and we have to study its decompositions in order to discover the structure of the group $(C_4H_4NO_3)$. Now, aspartic acid is attacked by nitrous acid, and the products are nitrogen gas, water, and malic acid, thus: $C_4H_7NO_4 + HNO_2 = C_4H_6O_5 + N_2 + H_2O$. Here we have the triad nitrogen of the aspartic acid replaced by the dyad O, and the monad group —O—H of the nitrous acid, and this leads to the formula  for aspartic acid. The equation above thus becomes:

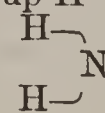


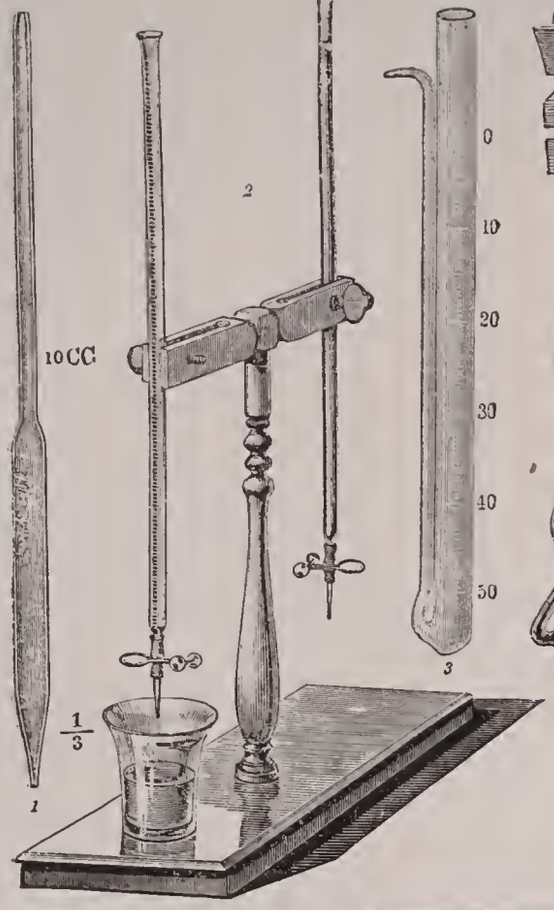
Aspartic Acid. Nitrous Acid. Nitrogen. Water. Malic Acid.

When malic acid is treated with hydrobromic acid, we obtain water and bromo-succinic acid:



Malic Acid. Hydrobromic Acid. Water. Bromo-succinic Acid.

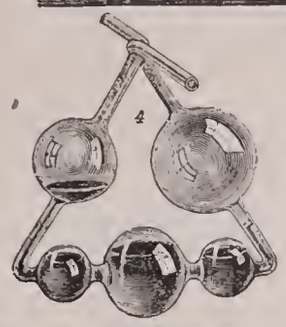
and we can prove that the group H—O—, here replaced by Br, is that one which in aspartic acid is represented by  . Bromo-succinic acid, when treated with nas-



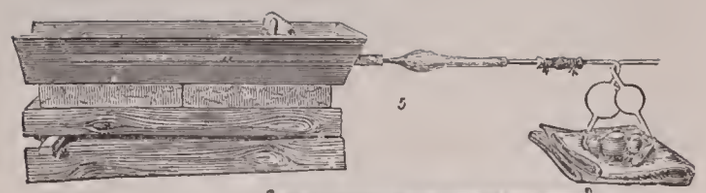
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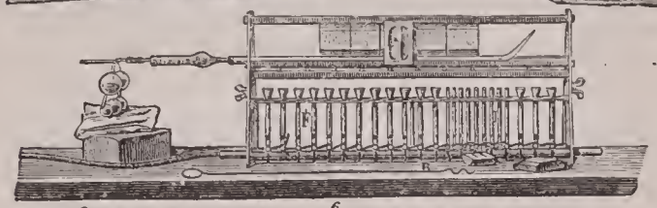
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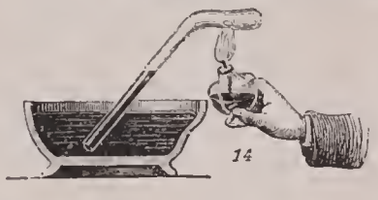
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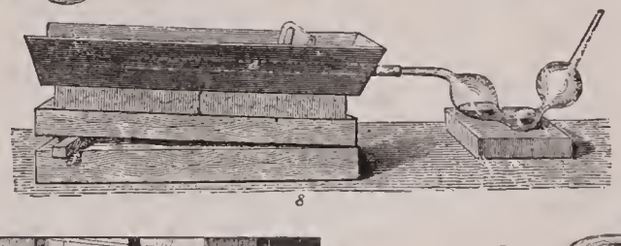
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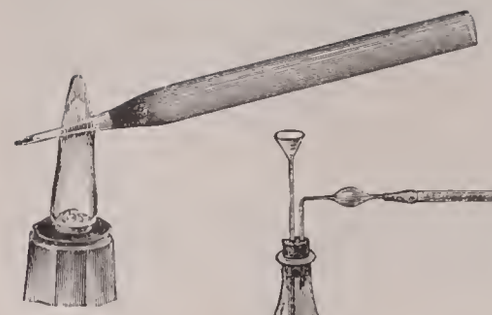
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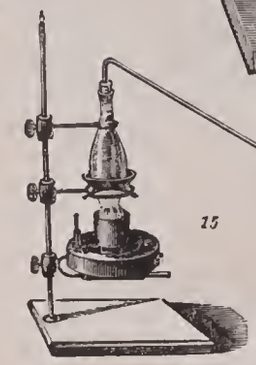


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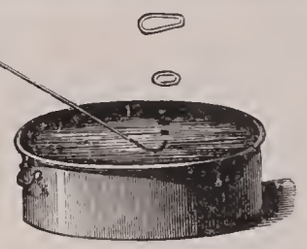


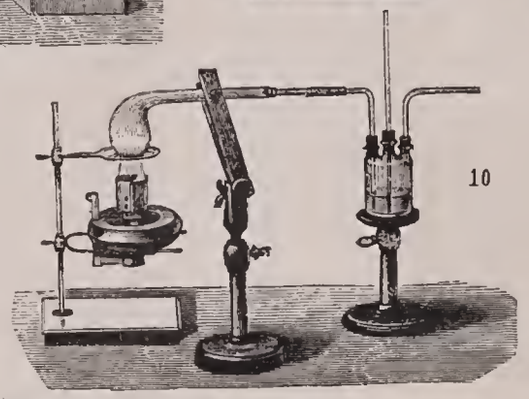
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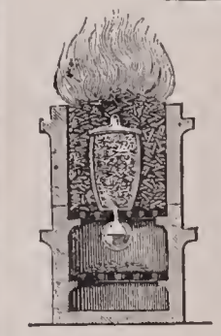
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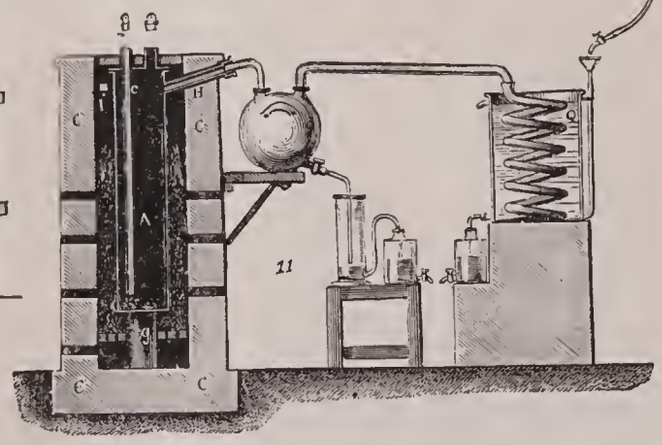


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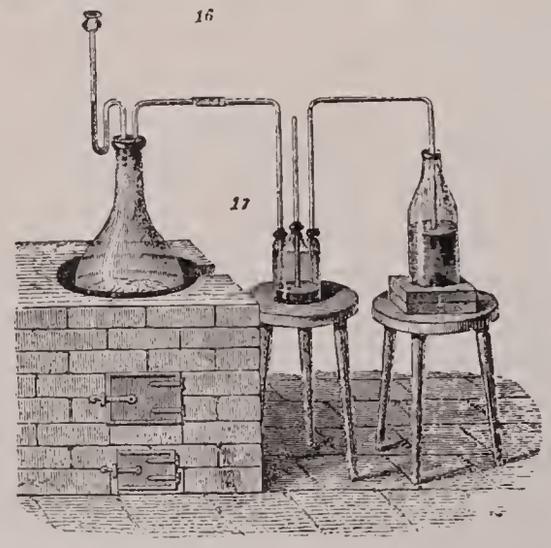
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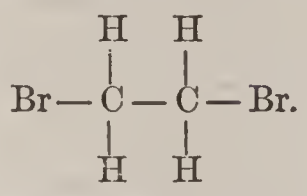


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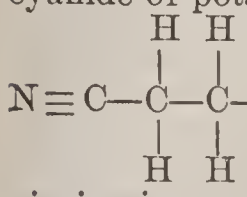
CHEMISTRY.—1. Pipette. 2. Trituration tubes. 3. Barette. 4. Liebig's potash apparatus. 5. Apparatus for organic analysis with carbon. 6. Gas-stove for organic analysis. 7. Chloride of calcium tube. 8. Determination of nitrogen. 9. Production of phosphate of calcium. 10. Production of nitrogen ; 11, of sulphurated hydrogen. 12, 13. Test for arsenic. 14. Decomposition of sulphuric acid gas. 15. Production of phosphoric acid gas ; 16, of sulphuric acid ; 17, of ammonia. 18. Interior of a laboratory.

cent hydrogen, has its bromine removed and hydrogen put in its place, thus yielding succinic acid ($C_4H_6O_4$). We shall most easily arrive at the structure of succinic acid by studying its synthesis.

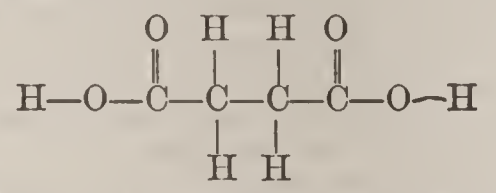
Olefiant gas (C_2H_4) unites with bromine to form a liquid having the composition ($C_2H_4Br_2$), and (as can easily be proved by its relation to glycol and glycollic acid), a structure represented thus:



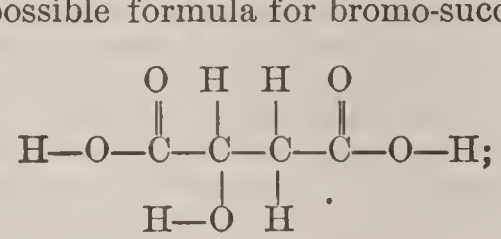
This bromide of ethylene, as it is called, when treated with cyanide of potassium, gives bromide of potassium, and a substance which may be called cyanide of ethylene—bromine and cyanogen changing places $(C_2H_4Br_2)+2KCN=C_2H_4(CN)_2+2KBr$. As cyanide of potassium is K—C≡N, it follows that cyanide of ethylene is



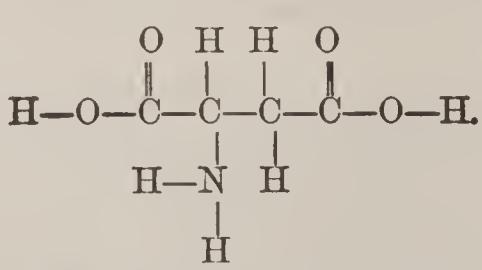
; when this product is boiled with caustic potash and water, ammonia is given off, and succinate of potash remains in solution. Here we have nitrogen uniting with hydrogen, while the place of the nitrogen is taken by that with which the hydrogen was united—viz., the dyad O, and the monad —O—K. We thus obtain the structural formula of succinic acid.



Here are obviously two hydrogen atoms having a different function from the rest—those, namely, which are replaceable by metal, and which, in the above formula, are represented as directly united to oxygen. That it is not one of these that is replaced by bromine follows from the fact that bromo-succinic acid has also two atoms of hydrogen replaceable by metals in exactly the same way as in succinic acid itself, and as the other four atoms of hydrogen do not differ in position in the diagram from one another, we have only one possible formula for bromo-succinic acid; and therefore, for malic acid:



and for aspartic acid:



We have, however, two possible structural formulæ for asparagine, as it is plain that the two groups H—O— in aspartic acid are not similar to one another, and we have not as yet any means of deciding between them. The reader will see that they are different, and from the way in which structure has been proved, will also see that reactions may be obtained which would decide between the two.

It is not necessary to give any further examples of chemical structure—the two we have treated in some detail may suffice to show how the principle is applied, and what is the nature of the evidence in favor of particular structural formulæ.

***CHEMISTS AND DRUGGISTS, LAWS RELATING TO.** Under the head Apothecary (q.v.) will be found the distinction between that profession and the kindred one of pharmaceutical chemist. The pharmaceutical society of Great Britain, founded in 1841 for raising the standard of efficiency in the practice of dispensing and compounding drugs, was incorporated by royal charter in 1843. An act was passed in 1852 defining the qualifications of pharmaceutical chemists, and the society's powers for examining and granting qualifying certificates. The pharmacy act of 1868, referred to below, still further defines its duties and privileges. As in the case of medical practitioners, there is no penalty for mere practice; but the assumption of the specific title named in the act is punishable by fine. The legislature presumes that certificates obtained by examination are evidence of efficient education, but that the freedom of engaging in business ought not to be interfered with; and that the right of the subject to consult whom he chooses, or to buy drugs from whom he will, must be respected. This seems a sound view.

Serious mistakes, such as the substitution of one medicine for another, to the injury of the purchaser, are punishable by law, both in the unqualified and in the case of those qualified under the act. The public also derives great and increasing security in this and in all other departments of human enterprise, from the improving effect of free competition. The operation of the act was simply that of indicating to the public, by a name or title, a class of druggists possessing a higher education. In 1868 it was deemed necessary, owing to the frequent evils arising from the facility of obtaining poisons, to enact that no person should sell, or keep open shop for selling poisons, or assume or use the title of chemist or druggist or pharmacist, unless he be registered under the act 31 and 32 Vict. c. 121, amended by 32 and 33 Vict. c. 117, and conform to the regulations as to sale of poisons. All persons who in 1868 carried on the business of chemists and druggists, and their apprentices and assistants, were entitled to be registered. The register of chemists and druggists under this act now contains the names of all qualified persons in Great Britain. See *Supp.*, page 895.

CHEM'ITYPE is the name given by its inventor, C. Pül, a Dane, to the art of producing on a metal plate, by a chemical process, an engraving in relief. The outline of the process is this: On a polished plate of zinc an etching or an engraving is made in the usual way. The depressions of this design are then filled up with a melted metal—the nature of which is not revealed—and this superadded metal is then reduced to the exact level of the zinc, so that the design now appears as if inlaid. An acid is next applied to the surface, which attacks the zinc, without affecting the inlaid metal; and thus there results an exact copy in relief of the original intaglio engraving. In competition with wood-cuts, relief-lithographs, and copperplates, C. does not seem as yet to evince any great superiority; it fails especially in that character of strength and softness which wood-cuts express so well. The prints produced by this art look more like engravings than like wood-cuts. They have this advantage, however, that they give an exact copy of the original design made by the artists on the metal; whereas in wood-cutting the drawing made on the block may be impaired in its effect by the engraver. C. is particularly adapted for producing maps by the common printing-press. Pül practiced his invention at first on a small scale in Copenhagen, from 1843 to 1846, and then extensively in Leipsic. In 1850, he went to Vienna, where he was employed in the imperial printing establishment.

CHEMNITZ, a t. of Saxony, is situated at the base of the Erzgebirge, and at the confluence of the river Chemnitz with three other rivers, in lat. 50° 50′ n., and long. 17° 55′ east. It is the principal manufacturing town of Saxony—its industry consisting in weaving cottons, woolens, and silks, and in printing calicoes, chiefly for German consumption. Cotton stockings are a most extensive manufacture, and rival the British in quality and cheapness. The American markets are chiefly supplied from this place. It has several extensive machine factories, producing machinery for flax and wool spinning, weaving, and mining industry. Amongst the numerous educational institutes of C. are schools of weaving, mining, and tailoring. For four centuries C. was a free imperial city. Traces of its antiquity are seen in many of the buildings. Pop. '75, 85,334.

CHEMNITZ, Martin, next to Luther and Melanchthon the most distinguished German Protestant theologian of the 16th c., was b. at Treuenbrietzen, in Brandenburg, 9th Nov., 1522; studied at Frankfurt and Wittenberg; and, in 1548, became rector of the cathedral-school of Königsberg. About 1550, he began to devote himself seriously to theology, and in 1553 went back to Wittenberg, where he delivered prelections on Melanchthon's *Loci Communes,* from which sprang his own *Loci Theologici,* which, for method and learning, excels all similar books of the same age. In 1554, he was made a preacher in Brunswick, where he wrote his *Repetitio Sanæ Doctrinæ de Vera Presentia Corporis et Sanguinis Domini in Cœna Sacra* (Leip. 1561), in which he defended Luther's view of the Lord's Supper against that of the Swiss reformers; the *Theologiæ Jesuitorum Præcipua Capita* (Leip. 1562); and the *Examen Concilii Tridentini* (Leip. 1565), a work in which he has argued with remarkable acuteness and learning against the dogmas of the church of Rome. His *Corpus Doctrinæ Prutenicæ* (1566), written in conjunction with Mörlin, became a standard work of divinity among the Prussian Protestants. But his greatest ecclesiastical achievement was inducing the Saxon and Suabian churches to adopt as their confession of faith the *Concordienformel,* and thus extending and consolidating the creed of Luther. He died at Brunswick, 8th April, 1586.

CHEMNITZIA, a genus of gasteropodous mollusca. It has a slender, elongated, many-whorled shell; the whorls striated; a simple semi-oval aperture; and a horny operculum. There are many recent species scattered all over the world. The discriminating characters of the fossil species being taken from the form of the shell, it is more than probable that the remains of very different animals are classed under this generic name. No less than 180 species have been described, occurring throughout all the divisions of the fossiliferous strata from the lower Silurian upwards.

CHEMOSH, the national deity of the Moabites and the Amorites. Solomon introduced the worship of C. into Jerusalem, but Josiah put a stop to it. Scholars are not

agreed as to descriptions either of the deity or the worship. Jerome identifies C. with Baal-Peor; others with Baal-Zebub; Genesius with Mars, or some god of war; some with Saturn, as the star of ill-omen; C. having, according to Jewish legend, been worshiped in the form of a black stone; and Maimonides says his worshipers went bareheaded, and used no garments sewn by the needle. Hackmann makes the name equivalent to "royal deity," and, apparently, children were sacrificed to him.

CHEMUNG', a co. in s. New York, on the Pennsylvania border, intersected by Tioga river, and traversed by the New York and Erie and the Northern Central railroads, and the canal from Seneca lake to Elmira; 513 sq.m.; pop. '80, 43,065. The surface is partly level and partly hilly; soil fertile. The chief productions are wheat, corn, oats, buckwheat, potatoes, hay, butter, wool, honey, and tobacco. There are in the county several carriage and wagon manufactories, flour-mills, saw-mills, tanneries, etc. Co. seat, Elmira.

CHENAB', the largest, according to general opinion, of the five rivers which give name to the Punjab. Like most of the principal streams of India, it rises to the n. of the Himalayas, making its way through the Ritanka pass at the height of 13,000 ft. above the sea, and having its source about lat. 32° 48′ n., and long. 77° 27′ east. After a descent of 300 m., the C. reaches the level country. At the close of a course of the same length, it receives, on its right, the Jhelum in lat. 31° 12′ n., and long. 72° 12′ e.; 50 m. further down, it is joined, on its left, by the Ravee; and 110 m. lower, it absorbs, through the Ghara, on its left, the mingled waters of the Beas and the Sutlej. Lastly, at a distance of 470 m. from the ocean, these united floods join the Indus.

CHENAN'GO, a co. in s. New York, on a branch of the Susquehanna, and the Chenango and Unadilla rivers, intersected by the Chenango canal, and the Albany and Susquehanna, the New York Midland, and a branch of the Delaware and Lackawanna railroads; 624 sq.m.; pop. '80, 39,890. It has an elevated, hilly, and broken surface, with fruitful soil, producing corn, wheat, oats, potatoes, hay, cheese, butter, wool, maple sugar, and hops. There are in the county more than 40 cheese factories, and several flour-mills, tanneries, furniture and carriage manufactories. Co. seat, Norwich.

CHENAN'GO RIVER, a stream in central New York, rising in Oneida co., and flowing, with a length of about 90 m., through Madison and Chenango counties to the Susquehanna, near the Pennsylvania boundary.

CHENDAREE, or CHUNDEREE. See CHANDHAIREE, *ante*.

CHENERY, THOMAS. See page 895.

CHENEY, CHARLES EDWARD, D.D., b. 1836; a graduate of Hobart college and a student in the Virginia theological seminary (Episcopal). He had pastoral charge in Rochester and Havana, N. Y., and in Chicago, Ill. In Dec., 1873, having left the Protestant Episcopal church, he was chosen assistant bishop, and afterwards bishop, of the Reformed Episcopal church, then newly organized. He is a vigorous thinker and an able organizer; he is still rector of Christ church, Chicago.

CHENEY, SETH. See page 895.

CHENEY, WARD. See page 895.

CHÉNIER, ANDRÉ-MARIE DE, 1762–94; a French poet, b. in Constantinople. He undertook military life, but resigned his commission after six months' trial, and returned to Paris, where he wrote idyllic poems, such as *Le Mendicant; L'Aveugle;* and *Le Jeune Malade.* Overwork made a journey for health necessary, and he traveled in Switzerland, Italy, and the Grecian islands. Returning to Paris in 1786, he recommenced study and work, and produced the *Elegies; Art d'Aimer; L'Invention; Hermes; Susanne,* and *La Liberté.* From 1787 to 1790, he resided in London as a secretary to the French embassy, but neither the position nor the people were congenial, and he returned to France, plunging at once into the revolution, then well under way, taking the moderate side. In 1791, he was defeated as a candidate for a seat in the national assembly, and the next year an invective against the Jacobins involved him in a quarrel with his brother Joseph, whom he was afterwards to defend against the attack of Burke. When the hopes of the monarchy were gone, he returned to literature, but the trial of the king brought him once more forward, and he took part in preparing the defense, and also drew up an appeal to the people, He was broken in health and spirits; Paris was dangerous; and he went to Versailles, where he wrote poems to "Fanny." At Passy, Jan. 6, 1794, he opposed the arrest of a lady in whose house he was living, an act which resulted in his own seizure and incarceration in St. Lazare. Here he wrote *La Jeune Captive* for the duchess of Fleury, and for the convention the furious iambics so often quoted. At the tribunal he appeared with 44 others, and 38, including himself, were condemned to execution. The next day, July 25, 1794, he, with the counts de Montalembert and de Crequi, was led to death. As he descended the steps of the conciergerie, he said to Roucher, "Je n'ai rien fait pour la posterité. Pourtant" (striking his forehead), "j'avais quelque chose là." Three days later, in the same place, Robespierre and his fellows were executed, and the "reign of terror" was at an end. C.'s poems, with the exception of two, remained unedited for a quarter of a century.

CHÉNIER, MARIE JOSEPH DE, 1764–1811; poet and dramatist, younger brother of André Chénier; b. in Constantinople, and educated at the college de Navarre. He also served a short time in the army, but left it for literary composition, producing, at the age

of 20, *Azemire*, a tragedy which was not very successful. His next work, however, *Charles XII.*, gave occasion for the commencement of Talma's renown, and gained great popularity. It still keeps the stage. Following these came *Henry VIII.* and *Calas;* in 1792, *Caius Gracchus*, which was proscribed and burned because of the anti-anarchical phrase "The law, and not blood;" and the drama *Timoleon*, proscribed in 1793. The death of his brother on the scaffold took him away from play-writing, which he attempted again only once (in 1804), when he produced *Cyrus*, which was not a success. He was long a prominent member of the Jacobin club; a member of the convention, and also of the council of five hundred, over both of which he presided; he had a seat in the tribunate, and belonged to the committees of public instruction, of general security, and of public safety. In 1806–7, he delivered a course of lectures, on the language and literature of France from the earliest period; and in 1808, at Napoleon's request, he prepared his *Tableau Historique de l'Etat et du Progres de la Litterature Française.* He was the author of many hymns, songs, and odes, among them the famous *Chant du Depart;* odes on the death of Mirabeau, the oligarchy of Robespierre, etc.; tragedies that never reached the stage, and translations from the Greek, Latin, and German authors. As a satirist he was said to possess great merit.

CHENONCEAUX, Castle of. See Bléré, *ante.*

Chenopodia'ceæ, or Salsola'ceæ, a natural order of exogenous plants, consisting of herbaceous and half-shrubby plants, with leaves entire or divided, and destitute of stipules. The flowers are inconspicuous, hermaphrodite, or unisexual; the perianth deeply divided, persistent; the stamens inserted into its base, opposite to its segments, and equal to them in number, or fewer; the ovary single, free, or occasionally adhering to the tube of the perianth, with a single ovule attached to the base of the cavity; the style generally with 2 to 4 divisions. The fruit is membranous, inclosed in the perianth, which sometimes becomes fleshy. The seed has a curved or spiral embryo.—There are about 360 known species, most of which have a weed-like appearance, and grow in waste places. They are widely diffused over the world, but are particularly abundant in the northern parts of Europe and Asia. Beet and spinage are among the best known and most useful plants of the order. Many are occasionally used as pot-herbs, as some species of *chenopodium* and of orache. The fruit of strawberry blite (*blitum capitatum* and *B. virgatum*), a common weed in the s. of Europe, has some resemblance in appearance to a strawberry, from the coherence of the fleshy perianths of a whole spike or head of flowers, and a sweetish, insipid taste. The seed of quinoa (q.v.) is used for food as a kind of grain. Some of the C. are aromatic (see Chenopodium). Some inhabit salt-marshes, and abound in soda, as the saltworts (q.v.).

Chenopo'dium, a genus of plants of the natural order *chenopodiaceæ*, of which some of the native British species are well known by the name of Goosefoot, as weeds growing in gardens, on heaps of rubbish, and in waste places. The species are mostly annuals, with entire or toothed leaves, which in some of them have a sort of mealy hoariness. They are mostly natives of Europe, and of the temperate parts of Asia; but some are natives of America, into which, however, some of the common European species have found their way, and are naturalized as weeds. The genus has hermaphrodite flowers, with perianth of five small green scales, five stamens, and solitary flat seeds. The leaves of many species are used as a substitute for spinage, particularly those of the Good Henry, Wild Spinage, or English Mercury (*C. bonus Henricus*), a perennial plant, native of Britain and other parts of Europe, often found growing by waysides, with stem more than a foot high, powdered with minute transparent globules, and large, alternate, triangular, arrow-shaped, entire leaves. It is cultivated in some places, particularly in Lincolnshire, chiefly for the leaves, but the young shoots are also used as asparagus. *C. intermedium, C. album*, etc., annuals, common in waste places, are also excellent substitutes for spinage. *C. olidum* or *vulvaria* (Stinking Goosefoot), an annual with an extremely nauseous odor, growing in waste places in Britain, etc., especially near the sea, is a popular medicine, in much repute as an antispasmodic and emmenagogue. *C. botrys*, a native of the s. of Europe, with pinnatifid leaves resembling those of the oak, and hence called Jerusalem Oak, is in use as an expectorant and anthelmintic. It is not fetid like the species last named, but agreeably fragrant. *C. ambrosioides* has a strong aromatic odor, is used in Mexico instead of tea, and is much cultivated in France, an infusion of it being deemed useful in nervous disorders. *C. anthelminticum*, the Wormseed of the United States, has a strong and somewhat aromatic odor, and a high reputation as a vermifuge. Its seeds are chiefly used, or the essential oil extracted from them, called *oil of wormseed.* More important than any of these species, as affording a principal article of food in the countries of which it is a native, is quinoa (q.v.).

CHEOPS, according to Herodotus, an Egyptian king, called Chombes by Diodorus, Souphis by Manetho, Saophis by Eratosthenes, and in Egyptian "Khufu." He was the second king of the fourth dynasty of Manetho, and the builder of the great pyramid at Ghizeh. His name was supposed to mean "wealthy," or "having much hair." He spent enormous sums on the pyramid (see Pyramid, *ante*), and one improbable story is that he was compelled through want of money to sacrifice the honor of his daughter to insure its completion. He is also depicted as impious towards the gods, closing the

temples, and stopping the worship; but subsequently repenting, and writing a sacred book much esteemed by the Egyptians. The monumental information about C. does not confirm the Greek historians; on the contrary, it records the construction of temples in honor of the gods, the repair of the shrine, and the gift of various figures to the temple of Isis and Athor, close to his own pyramid, and his construction or repair of the temple of the same goddess Athor, the Egyptian Venus, at Denderah, or Tentyris. C. carried on war at the valley Magarah, in the peninsula of Sinai in Arabia; and a rock tablet represents him as having conquered the hostile tribes in the presence of the god Thoth, who had revealed to him the mines of the locality. His oppression had so afflicted Egypt, that charges of impiety had attached to his name; but the tombs of his children reveal no change in the established religion, and his pyramid differs from those of his predecessors and immediate successor only by its larger size and greater beauty. The date of C., according to Lepsius, is 3,095 to 3,032 B.C.; but great difference of opinion, amounting to nearly 2,000 years, exists as to the time of Menes, from whom the lists separate him by an interval of 898 years.

CHEPHREN, in the hieroglyphs "Khafra," called also Cephren, Chabrias, Souphis II., and Saophis II.; according to the legends, the son or brother of the Egyptian king Cheops. He built the second of the great pyramids at Ghizeh, near the sphynx and the great pyramid, and was said to have been tyrannical and hated, like his brother, so that his mummy was not buried in the sepulcher, but torn to pieces, and the sarcophagus emptied of its contents; but there is no more reason for believing in his impiety than in that of Cheops. His wife was a priestess of the god Thoth, and another prince of the family was a priest at Hermopolis. He also built the small temple behind the sphynx. It is probable that he lived 95 years, and his reign, according to Lepsius, was 3,032 to 2,966 B.C. A statue of him is in the Boulaq museum.

CHEP'STOW, a river-port in the s.e. of Monmouthshire, on the right bank of the Wye, 2½ m. from its junction with the estuary of the Severn, and 14½ m. e.n.e. of Newport. It lies between bold cliffs, on a slope rising from the river, in the midst of beautiful and grand scenery. There is a fine view from a rock called Windcliff, 970 ft. high, 3 m. and a half up the river. The streets are broad. Here occurs the highest tide in Europe, rising suddenly, with a fierce current, often 50, and on rare occasions even 70 feet. Large vessels reach the town. One of the wells of the town ebbs and flows with the tide. Over the Wye is a railway bridge combining the suspension and tubular principles of construction. C. has a magnificent castle, built in the 11th c., and a fine Benedictine priory recently restored. It has few manufactures, but exports corn, cider, bark, iron, millstones, timber, and salmon. Pop. '81, 3,585. In 1875, 1013 vessels, of 31,586 tons, entered and cleared the port.

CHEQUE. See CHECK, *ante.*

CHER, a tributary on the left side of the river Loire, rising near Crocq, in the department of Creuse; flows first n. by Auzances, Evaux, Montluç, and St. Amand; then n.w. through the department of C. by Vierzon; then westward by Selles, Montrichard, and Bléré, to the Loire, which it joins below Tours. Its whole length is about 200 m.; and it is navigable for the last 47 of its course.—CHER, the central department of France, to which the above river gives its name, is situated in lat. 46° 25′ to 47° 39′ n., and in long. 1° 55′ to 3° 10′ east. The surface is mostly level, traversed by well-wooded elevations, and produces corn, fruits, wine, hemp, flax, etc. The climate is mild and pleasant. Agriculture and pasturage of cattle are both capable of improvement. Area, upwards of 2,700 sq. miles. Pop. '76, 345,613. C. is divided into the three arrondissements—Bourges, St. Amand, and Sancerre. Bourges is the chief town.

CHERAS'CO, a t. in the province of Cuneo, n. Italy, situated on the Tanaro, 30 m. s.e. of Turin. It has manufactures of silk, and a pop. of (1871) 4,694. A peace was concluded here between Louis XIII. of France, and the duke of Savoy in 1631. On April 26, 1796, the place was taken by the French; and here, three days after, the "Armistice of Cherasco" was concluded between the Sardinian commissioners and Napoleon, by which the latter obtained the right of free passage for his troops through the Sardinian states; and the treaty that followed gave to the French republic Savoy, Nice, and the possessions of Piedmont to the westward of the Alps' highest ridge.

CHERBOURG, a fortified seaport t. and arsenal of France in the department of Manche, is situated at the head of a deep bay on the northern extremity of the peninsula of Cotentin, on the English channel, and opposite the w. coast of the isle of Wight, in lat. 49° 40′ n., and long. 1° 35′ west. Napoleon I. began to build the great defenses of this northern stronghold of France. His nephew, Napoleon III., developed his plans, but not with the original view of an invasion of England. Occupying a prominent position on the French coast, only some 60 m. removed from the s. shore of England, the harbor-works have been extended, strengthened, fortified, and provisioned with cannon—the dock-yards improved, and facilities of embarkation afforded, to a degree that, as it is unparalleled in ancient or modern times, not unnaturally excites the lively apprehension of Englishmen. A description of the stupendous breakwater of C., inclosing a space of nearly 2000 acres, will be found in the article BREAKWATER. In connection with its fortifications, this breakwater assumes an importance that attaches

to no other work of the kind in existence. At the apex of the angle formed by the meeting of the two branches of the breakwater or *digue*, there is a center fort or battery, measuring 509 ft. on the inner line of the parapet, which forms a flat semi-ellipse. The circular forts at the extremities of the breakwater are remarkably well placed for purposes of defense. Behind the center battery there is to be an elliptical tower, measuring 225 ft. on the major, and 123 ft. on the minor axis. Altogether there are six large batteries on the mole. The entrances to the harbor are round the ends of the mole; and the passages are further defended by the fortifications of the Ile Pélée, and by the batteries of La Roche Chavaignac and fort Querqueville. A series of coast redoubts, and the two large fortifications of Les Roches des Flamands and du Homet, are situated behind this outer zone of defense. "The arsenal," says Mr. W. H. Russell, who visited C. during the summer of 1860, "is inclosed by a continuous line of bastion and curtain of a very elevated profile, defended by outworks, wet and dry ditches, and by profuse batteries of the heaviest guns, either in casement or *en barbette*. Wherever you look, you fancy that on the spot you occupy are specially pointed dozens of the dull black eyes from their rigid lids of stone." Altogether, besides the batteries on the mole, C. is defended by 24 regular forts and redoubts. The town itself is commanded by La Roule (an exceedingly strong fort) and fort d'Octeville on the heights behind. The military port of C. consists of an outer harbor of 776 ft. in length by 663 ft. wide, its minimum depth being 58 ft., and the entrance to which is 206 ft. wide at its narrowest point. This harbor communicates by means of a lock with a floating basin, 957 ft. long by 712 wide. The outer harbor has four building-slips for 120-gun ships, besides some smaller slips, and a fine graving-dock. In Aug., 1858, an inner floating-harbor was inaugurated by the emperor of the French, in presence of the queen and many of the lords and commons of Great Britain. This harbor, entirely cut out of the solid rock, has a length of about 930 yards, and a breadth of 437 yards, and is surrounded by beautiful building-slips and capacious graving-docks. It is calculated that the roads of C. cannot, on account of the small depth of the greater portion, shelter more than 25 or 30 sail of the line, and about as many frigates, at one time. C. has a commercial port quite distinct from the other, situated on the s.e.; but it displays little activity, the principal exports being eggs, butter, and cattle. The town itself is insignificant, the streets being narrow and dirty; and there are no public buildings of note. There are some manufactures of hosiery, chemicals, lace, and leather, and sugar and salt refineries; but the industrial energies of the great bulk of the population are absorbed in the arsenal and dock-yards. C. is a very ancient place; in the 10th c. it was known under the name of *Carusburg*. In 1758, C. was taken by the English, who destroyed the naval and military works, and levied a contribution on the town. Pop., exclusive of naval and military forces (1876), 36,338.

CHERBULIEZ, Antoine Élisée, 1797–1869; a native of Switzerland, professor of political economy in Geneva and in the national polytechnic school in Zurich. He was a contributor to cyclopædias and periodicals, and author of *L'Utilitaire*, and *Preces de la Science économique*.

CHERBULIEZ, Victor, b. 1832; a Swiss author, the son of a Hebrew professor in Geneva. He has written many novels for the *Revue des Deux Mondes* (Paris), among them *Le Comte Kostia; Le Prince Vitale; Paule Mére; Le Roman d'une honnête Femme; and L'Idee de Jean Têterol.* C. became a member of the French Acad., '81.

CHER'IBON, or Sheribon, a seaport t. of Java, situated on the n. coast, 125 m. e.s.e. of Batavia. It has a considerable trade in coffee, indigo, and teak-wood, and is the residence of a Dutch governor. Pop. 11,000.

CHERIMOY'ER, or Chirimoya, *Anona cherimolia*, the most esteemed fruit of Brazil and Peru, now common and even naturalized in some parts of the East Indies, and other tropical countries of the old world. It is a fruit of most delicious flavor, is sometimes described as the finest of all fruits, and sometimes as inferior only to the mangosteen. It belongs to the same genus with the custard apple (q.v.). Both flowers and fruit emit a pleasant fragrance, but when the tree is covered with blossom, the odor is so strong as to be almost overpowering. The fruit varies from the size of an orange to 16 lbs. or upwards in weight. It is roundish, or heart-shaped. Externally, it is greenish, covered with small knobs and scales. The skin is rather thick and tough. Internally, the fruit is snow-white and juicy, and contains a number of small brown seeds. The eatable part is soft like a custard, and forms almost the entire mass of the fruit. The C. attains its highest excellence only in particular soils and situations, and some varieties are much finer than others. No tropical fruit seems better to deserve a higher degree of attention than it has yet received in our hot-houses.

CHERKASK'. See Tcherkask.

CHEROKEE, a co. in n.e. Alabama, on the Georgia border, on the Coosa and Chattooga rivers, reached by the Selma, Rome, and Dalton railroad; 250 sq.m.; pop. '80, 19,109—2691 colored. The surface is mountainous, and in large part covered with forests of pine and oak. Productions mainly agricultural. Co. seat, Centre.

CHEROKEE, a co. in n.w. Georgia, on the Etowah river, which is navigable by steamboats; 620 sq.m.; pop. '80, 14, 325—1623 colored. It has a rolling surface and fertile soil, yielding the usual agricultural crops. Co. seat, Canton.

CHEROKEE, a co. in n.w. Iowa, on Little Sioux and Maple rivers, traversed by the Dubuque and Sioux City railroad; 600 sq.m.; pop. '80, 8240. Agriculture is the chief business. Co. seat, Cherokee.

CHEROKEE, a co. in s.e. Kansas, bordering on Missouri and the Indian territory; 604 sq.m.; pop. 80, 21,907. It is an agricultural region, and is intersected by the Missouri, Fort Scott, and Gulf railroad. Co. seat, Columbus.

CHEROKEE, a co. in s.w. North Carolina, the extreme point of the state, adjoining Georgia and Tennessee; 650 sq.m.; pop. '80, 8182. It has a mountainous forest-covered surface, and is little cultivated. Co. seat, Murphy.

CHEROKEE, a co. in e. Texas, between the Angelina and the Neches rivers, intersected by the International and Great Northern railroad; 1144 sq.m.; pop. 80, 16,724—5710 colored. It is in an excellent agricultural region, consisting of alternating woodland and prairie. Co. seat, Rusk.

CHEROKEES, in their own tongue called Tsanaghee, a tribe of Indians of the United States, now settled in the Indian territory, where they occupy 5,960 sq.m. in the n.e., and 8,500 along the n. side. Their original home was in the country now forming portions of Florida, Georgia, Alabama, Mississippi, and Tennessee. They were then in two great divisions, the Ottare, or Otari, dwelling in the mountainous districts, and the Airate, or Erati, occupying the lower lands; and they were further divided into seven clans, each of which prohibited intermarriage between its own members. They adhered to the English in early colonial times, formally recognized the king in 1730, and in 1755 ceded territory and permitted the establishment of English forts. The tribe was considerably advanced in civilization when the war of the revolution began. They clung to the royalist side, and in consequence their country was laid waste by American forces. They were subjugated after a few years of intermittent war, during which they lost much territory, and, by the treaty of Hopewell, Nov. 28, 1785, they acknowledged the sovereignty of the United States, and were confirmed in the possession of their hunting grounds. Then began the ever-recurring story of white man's encroachment and red man's resistance, with the ultimate advantage on the side of the intruders. By treaties in 1791 and 1798, portions of their territory were surrendered, and many of their people emigrated beyond the Mississippi. In 1817, the C. on the Arkansas numbered 3,000. Those who remained in their old territory abandoned hunting, and the greater portion of them lived by agriculture. But the white men of Georgia, who coveted their lands, demanded the removal of the remaining C. notwithstanding the great services which they had rendered (1812–15) in the war with England; and though the Indians were entirely peaceable, generally industrious, and were fast becoming Christianized by the efforts of Moravian missionaries and those of the American board, the clamor for their removal prevailed, and in July, 1817, they were forced to exchange their eastern lands for territory w. of the Mississippi. The end was not effected, however, without much trouble and bloodshed. Georgia passed laws extending over the territory of the C., by which the Indians were practically outlawed, deprived of citizenship, and prohibited from being witnesses. They appealed to the U. S. supreme court, and that body—which long afterward decided that a negro had no rights that a white man was bound to respect—refused the Indians the right to bring an action; and finally the general government confessed its inability to fulfill its own treaty obligations. But this inability did not prevent the federal government (in 1835) from making a treaty with a small portion of the tribe for the removal of the whole of them, and three years later an armed force was sent into their country to compel the removal. At that time the whole number of Indians in their old homes was about 27,000. The Indians were themselves divided; one section, led by John Ross, at first opposed, but at last directed the removal. Within a few years, after much difficulty and not a few murders, their removal was effected. Since their occupation of a share of the Indian territory, the C. have greatly advanced in learning and in material prosperity. About 1821, a member of the tribe invented an alphabet, and books and newspapers have been printed in their own language for half a century. In the war of the rebellion, they at first favored the confederates, but the majority soon came over to the union side. Between the two armies, their territory suffered severely, and they were compelled to emancipate their slaves. The territory of the C. now amounts to about 5,000,000 acres, and they have, in the keeping of the United States, school and orphan funds to the amount of about $1,600,000. They are governed by a national committee and council elected for two years, and a chief who is chosen for four years. In 1882, the C. numbered 20,336. Their public school system is admirable. They live in well-built villages, and are peaceable and industrious. Tahlequah is their chief town, and contains two colleges and a newspaper office

CHERRY, *Cerasus*, a genus or sub-genus of plants, of which the best known yields one of our most esteemed stone-fruits. This is usually regarded as a sub-genus of *prunus* (see PLUM), but is erected by some botanists into a distinct genus on very slender grounds, the most obvious distinction between the species of *cerasus* and the true species

of *prunus* being that, in the former, the young leaves are conduplicate, or folded up, and in the latter they are convolute, or rolled together. Two species are pretty generally regarded as the parents of the garden cherries usually cultivated, *prunus* or *cerasus avium*, and *P. cerasus* or *C. vulgaris*—the former having the underside of the leaves hairy and a small austere fruit; the latter having smooth shining leaves and a more juicy fruit. *C. avium* attains a height of 40 to 50 feet *C. vulgaris* is a smaller tree. Both have white flowers in clusters or nearly sessile umbels, and both are generally regarded as natives of Britain, and of the middle and s. of Europe. In a wild state, they are usually called GEAN (*guigne*), and *C. avium* is frequently planted—not only because it is exceedingly ornamental when in flower, but also as a timber-tree, being of rapid growth, with firm, strong, close-grained wood, suitable for the purposes of cabinet-makers, turners, and musical-instrument makers. But according to some botanists, there is only one species, of which these are varieties; and according to others, *C. vulgaris* is a native of Syria and other parts of western Asia, and is only naturalized in Europe, having been first brought to Italy by Lucullus, after his victory over Mithridates (74 B.C.). from Kerasunt, on the coast of the Black sea, from whence it derives its name. The cultivated varieties of the C. are very numerous, and differ very considerably in size, color, and flavor. The fruit of the C. supplies the inhabitants of some parts of France with a principal article of food, especially the wood-cutters and charcoal-burners of the forests; and among their modes of preparing it is that of making it a principal ingredient in soups. It ripens in Norway and East Bothnia as far n. as lat. 63°. In some parts of Germany, the public roads are lined for many miles together with avenues of C. trees. Besides its use for the dessert and for preserves, the C. is extensively used for making liquors. See KIRSCHWASSER and MARASCHINO. Varieties of C. with double flowers, and with pendulous branches, are frequently planted for ornament in shrubberies, and few trees or shrubs are more beautiful. The *all-saints C.* produces flowers almost all summer, and even in autumn. Its fruit is small and rather acid.—The other species of C. are numerous. Some species are low, or even prostrate shrubs, as *C.* or *P. chamæ-cerasus*, the GROUND C. of the s. of Europe and of Siberia; and *C.* or *P. pumila*, the SAND C. of North America.—The genus or sub-genus *cerasus* contains also the different kinds of bird C. (q.v.) and choke C. (q.v.), including the American WILD C., famous for its medicinal bark; the MAHALEB (*C.* or *P. mahaleb*) of the s. of Europe, and the CAPOLLIM (*C.* or *P. capollim*) of Mexico and Peru—the first famous for the fragrance of its flowers, and the second for the fragrance of its fruit; and the Cherry-laurel (q.v.).

CHERRY, a co. in Nebraska; formed 1883.

CHERRY-LAUREL, or LAUREL-CHERRY, a name given to those species of *prunus* or *cerasus* (see CHERRY) which have evergreen leaves. They are also often called LAUREL. They have small flowers in long racemes, and small fruit; the fruit of a nauseous taste; and most parts of the plant, but particularly the leaves and kernels, remarkably abounding in hydrocyanic (prussic) acid, and therefore very poisonous.—The COMMON CHERRY-LAUREL, sometimes called the BAY-LAUREL or LAUREL-BAY, very often spoken of simply as the LAUREL or COMMON LAUREL (*prunus* or *cerasus lauro-cerasus*), is a shrub, sometimes of very large size, with ovato-lanceolate, convex, smooth, remotely serrated, shining, yellowish green leaves, and erect racemes of flowers. It is originally from Asia, but is now naturalized throughout the s. of Europe, and is one of the most common ornamental shrubs in Britain, where it suffers only from such severe frosts as are of rare occurrence. It is propagated by seeds, layers, and cuttings. Its leaves resemble bitter almonds in smell and taste, and contain in great abundance the same essential oil (see ALMONDS, VOLATILE OIL OF), rich in hydrocyanic acid. From these leaves, by maceration in water for 24 hours, and subsequent distillation, is obtained the *laurel-water* (q.v.), or *cherry-laurel water*, sometimes employed in medicine as a substitute for hydrocyanic acid, and which formerly was so much used as a poison. The leaves are sometimes employed also for flavoring puddings, sauces, etc., and are safer for such purposes than oil of bitter almonds, but ought to be used with caution.—Another species, also very common as an ornamental shrub in Britain, but not quite so hardy as the common cherry-laurel, is the PORTUGAL LAUREL (*prunus* or *cerasus Lusitanica*), a native of Portugal, a large shrub—sometimes a tree—with dark-green leaves and lateral racemes. It does not grow so well under the shade of trees as the common cherry-laurel. From the dissimilarity of form and color of their leaves, these species present a pleasant appearance when mixed, as they usually are, in the shrubbery.

CHERRY VALLEY, a village in Otsego co., N. Y., 68 m. w. of Albany, reached by way of the Albany and Susquehanna railroad; pop. of township, '80, 2,260. The village was the scene of a massacre of Americans, Oct. 11, 1778, by Indians and tories under direction of British officers; 16 soldiers of the revolutionary army and 32 inhabitants, nearly all women and children, were killed, and all others carried into captivity. Every house in the settlement was burned.

CHER'SIPHRON, an architect of Crete, who, with his son Metagenes, built or began to build the great temple of Artemis at Ephesus, commenced about 600 B.C. The columns were erected about 40 years later. It was completed 220 years after its commencement, and a few years afterwards was destroyed by fire on the night in which Alexander the Great was born. It was called one of the seven wonders of the world.

CHER'SO, an island of Illyria, belonging to Austria, in the Adriatic, 12 m. s.s.w. of Fiume. A bridge unites it with the adjoining isle of Lossini. It has an area of about 105 sq.m., with a pop. of (1869) 14,000. Its surface is generally hilly and rugged, with forests in the north. The chief town is Cherso, at the head of a bay on the w. side. Pop. '69, 7,590.

CHERSON'. See KHERSON.

CHERSONE'SUS, the ancient name of several peninsulas and promontories in Europe, the most important of which are the Crimea (q.v.), *C. Taurica;* Gallipoli (q.v.), *C. Thracia;* and Jutland (q.v.), *C. Cimbrica.*

CHERT, or HORNSTONE, a variety of quartz, always massive, and having a kind of granular appearance and structure. It is common in the mountain limestone, oolite, and greensand formations; sometimes forms rocks; and often contains petrifactions. It passes into common quartz and chalcedony, also into flint and flinty slate. Its colors are gray, white, red, yellow, green, or brown. The name C. is sometimes limited to the finer varieties, and the coarser are called hornstone.—The name C. is very commonly given to the silicious concretions which occur as nodules and layers in limestone rocks, like flints in the chalk. When these materials exist to such an extent as to render the limestone useless for economical purposes, it is said to be "cherty."

CHERT'SEY (Anglo-Saxon, Ceort's Eye or Island), a t. in the co. of Surrey, on a low strip of land between the right bank of the Thames, here crossed by a stone bridge, and the brook from Virginia water, 20 m. w.s.w. of London. It is irregularly built, chiefly consisting of two long cross-streets, and is surrounded by villas. The chief trade is in malt and flour. Many vegetables are raised for the London market. Pop. '71, 3,146. C. arose in a monastery founded in 666, and rebuilt in 964 by Edgar and the Benedictine monks. The South Saxon kings had a seat here during the heptarchy. Charles James Fox lived on St. Anne's hill, an abrupt elevation about a mile from the town. Cowley the poet resided in Chertsey.

CHERUB, in the plural *cherubim* or *cherubs,* is the Hebrew name of a winged creature with a human countenance, which in the Scriptures is almost always represented in connection with Jehovah, and especially as drawing his chariot-throne. Cherubim are first mentioned in the Old Testament as guards of paradise; a C. with a flaming sword hindered the return of the expelled human pair. In the Holy of Holies in the tabernacle, and afterwards in the temple, cherubim wrought in embossed metal were represented above the mercy-seat, or covering of the ark of the covenant, so that they appeared to rise out of it. Figures of cherubim were also wrought into the hangings of the Holy of Holies. The cherubim that appear in the visions of Ezekiel and the revelations of John depart much from the early representations. In Ezekiel they have the body of a man, whose head, besides a human countenance, has also that of a lion, an ox, and an eagle; they are provided with four wings, two of which support the chariot of Jehovah, and serve to fly, while the other two cover the body; the hands are under the wings, and the whole body is spangled with innumerable eyes. In the revelation, four cherubim, covered with eyes, and having six wings, surround the throne of Jehovah; the first has the face of a lion, the second of an ox, the third of a man, and the fourth of an eagle. This gave rise at a very early period to the symbolical figures of the four evangelists, the human countenance being associated with Matthew, that of the lion with Mark, of the ox with Luke, and of the eagle with John. Most Jewish writers and Christian fathers conceived the cherubim as angels; and Dionysius the Areopagite, in his *Celestial Hierarchy,* makes them a separate class in the first hierarchy. Most theologians also considered them as angels, until Michaelis showed them to be a poetical creation; and Herder, in his *Spirit of Hebrew Poetry,* compared them tothe griffins that watch treasures, and other fabulous figures. In Christian art, they are generally represented as sexless figures, with wings from the shoulders, the legs also being either covered by wings, or having wings substituted for them. Very often they have also a glory round the head.

CHERUBINI, LUIGI-CARLO-ZENOBIO-SALVATORE-MARIA, an eminent musical composer, was b. at Florence in 1760, and received his early musical training there under the Felici (father and son), P. Bizzari, and C. Castrucci. He afterwards studied for a year at Bologna under Sarti, to whom he owed his thorough knowledge of counterpoint and fugue. He visited London in 1784, where he brought out two operas, *La Finta Principessa* and *Giulio Sabino,* and afterwards settled in Paris for the remainder of his life, paying occasional visits to Italy. His *Ifigenia in Aulide* appeared in 1788; and in 1791, his *Lodoïska,* which work first secured proper appreciation for his genius, and effected a change in the whole character of the French school of composition. These operas were followed in succession by *Elisa, Medea, Les Deux Journées* (also known as *Die Wasserträger*), *Anacreon,* and *L'Hôtellerie Portugaise.* His latest opera, *Ali Baba,* was produced, after a long interval, in 1833. Besides operas, C. wrote numerous masses, motets, and other sacred compositions of so great merit, that Beethoven regarded him as the greatest living master of sacred music; also quartets for the violin, viola, and

violoncello, and symphonies. His latest work, *Cours de Contrepoint et de Fugue*, appeared in 1835. C. died at Paris in 1842, and his *Requiem*, the last of his masses, was performed at his funeral service.

CHERUBI'NI, Maria Luigi Carlo Zenobi Salvador, one of the best Italian composers, was b. Sept. 8, 1760, at Florence, and d. Mar. 15, 1842, in Paris, where he was director of the conservatoire. In his thirteenth year, by his early compositions—a mass and an intermezzo—he attracted the attention of Sarti, who received him as a pupil. In the interval from 1780 to 1788, he composed eleven Italian operas, including *Ifigenia in Aulide*, the most successful of the series. In 1784, he visited London. After 1786, C. resided chiefly in Paris, whence his fame rapidly extended over Europe. Besides the *Ifigenia*, his chief pieces are *Demophoon* (1788), *Lodoiska* (1791), *Elisa* (1794), *Médée* (1797), the *Portuguese Inn* (1798), *Les Deux Journées*, and *Anacreon.* C. also composed church music, chamber music, etc., with singular beauty and success. It is worthy of remark, that the richness of his instrumental music, which was once made a ground of objection, now appears moderate as contrasted with the monstrous prodigalities of the modern orchestra. See *Cherubini: Memorials illustrating his Life*, by Bellasis (Lond. 1874).

CHERUSCI, a German tribe first mentioned by Cæsar. They first dwelt n. of the Silva Bacencis, or Harz forest, but the exact boundaries of their territory cannot be ascertained. They are chiefly memorable in connection with their great leader Arminius, or Hermann, who, having formed an alliance with other German tribes, attacked and annihilated the Roman legions under Varus, in the forest of Teutoburg, 9 A.D. After the death of Arminius, internal strifes broke out among the C., and Tacitus says that they were subjugated by the Chatti, a neighboring tribe. Notwithstanding this, they again appear as the chief tribe in the military league of the Saxons about the end of the 3d century. In the beginning of the 4th c., they are included among the peoples who had leagued against Constantine, and towards the close of the same are still mentioned distinctively by Claudian.

CHER'VIL, *Anthriscus cerefolium*, an umbelliferous plant, which has been long cultivated as a pot-herb, and used in soups and for a garnish, etc., in the same manner as parsley. It is much more used in some parts of the continent of Europe than in Britain. It is a native of Europe, naturalized in some parts of England. The leaves have a peculiar, somewhat sweetish, pleasantly aromatic smell and taste, by which the plant may be known from its congener *anthriscus vulgaris* or *scandix anthriscus*, a poisonous weed, whose leaves have a disagreeable smell, and which is also distinguished by its hispid fruit. There is a variety of C. with large roots, for the sake of which it is cultivated.—The umbelliferous plant called Venus' Comb or Shepherd's Needle (*scandix pecten* or *S. pecten veneris*), a native of Britain and of the continent of Europe, often found in corn-fields, and remarkable for the appearance and large size of its fruit, and another species (*S. australis*) which grows in the s. of Europe, have a taste and smell resembling C., and are used in the same way on the continent. Sweet C. or Sweet Cicely (*myrrhis odorata; scandix odorata* of the older botanists), a native of the s. of Europe and of some parts of Asia, common in the neighborhood of houses in Britain, although probably not a true native, is frequently cultivated in Germany under the name of *Spanish C.* or *anise chervil.* In Scotland, the plant is commonly called *myrrh* by the peasantry. Its smell is peculiarly attractive to bees; and the insides of empty hives are sometimes rubbed with its leaves, to induce swarms to enter.—The species of *chærophyllum*, coarse weeds, are also called chervil.

CHESAPEAKE BAY, the largest inlet on the Atlantic coast of the United States, being 200 m. long, and from 4 to 40 broad. Its entrance, 12 m. wide, has, on the n., cape Charles, in lat. 37° 3′ n., and long. 76° 2′ w.; and on the s., cape Henry, in lat. 36° 56′ n., and long. 76° 4′ w., both promontories being in Virginia. C. B. has numerous arms, which receive many navigable rivers, such as the Susquehanna and the Patapsco on the n., through Maryland; the James on the s.w., from Virginia; and the Potomac on the w., between these two states. Unlike the shallow sounds towards the s. (see Carolinas), this network of gulfs and estuaries, to say nothing of its noble feeders, affords depth of water for ships of any burden, virtually carrying the ocean up to the wharves of Baltimore and the arsenals of Washington.

CHESAPEAKE, Va. See page 895.

CHESEBRO', Caroline, 1825–73: a native of New York, author of a number of works of fiction, mostly of a moral or religious nature; among them, *Dreamland by Daylight; The Little Cross-bearers; The Fisherman's Daughter; The Beautiful Gate;* and *The Foe in the Household.* She was for many years a teacher in the Packer institute, in Brooklyn, N. Y.

CHE'SELDEN, William, an English surgeon and anatomist, was b. in 1688, at Barrow-on-the-Hill, in Leicestershire. He commenced his medical studies at fifteen, at twenty-three established himself as a lecturer on anatomy, and in the following year was elected a fellow of the royal society. He was afterwards appointed surgeon to St. Thomas's, St. George's, and Westminster hospitals, where he acquired great reputation as an operator. In this respect, few surgeons, if any, ever surpassed him. He died at

Bath, 11th April, 1752. C.'s principal works are *Anatomy of the Human Body* (1713), long a text-book on the subject in England; a *Treatise on the Operation for the Stone* (1723); and *Osteology, or Anatomy of the Bones* (1733). He also contributed several valuable papers to the philosophical transactions of the royal society.

CHESHIRE, a co. in s.w. New Hampshire, bordering on Vermont and Massachusetts, bounded on the w. by the Connecticut and drained by the Ashuelot river, and traversed by the Ashuelot and Cheshire railroad; 770 sq.m.; pop. '80, 28,734. It has a hilly surface, with some mountains, the highest being Grand Monadnock. There are several small lakes and ponds in the county. The soil is fertile, particularly along the rivers. The chief productions are grain, potatoes, hay, wool, butter, cheese, and maple sugar; and there are also many manufactories. Co. seat, Keene.

CHESHIRE, a maritime co. in the w. of England, bounded n. by the river Mersey, and partly also by the Irish sea, in lat. 52° 56′ to 53° 54′ n., long. 1° 47′ to 3° 11′ west. Its greatest length from n.e. to s.w. is 58 m.; greatest breadth, 32; area, 1052 sq.m., of which only $\frac{1}{16}$ is uncultivated; circuit, 200 m., of which 8 are coast. The surface forms an extensive nearly level plain between the Derbyshire and Welsh mountains, well wooded, and studded with small lakes or meres, and chiefly occupied by grazing and dairy tracts, which are among the most important in England. This plain, comprising four fifths of the surface, rests on new red sandstone, and is crossed, near the middle, by a tract of high ground running s.w. from a promontory overlooking the Mersey, near the mouth of the Weaver, to Beeston castle rock, 366 ft. high. On the e. border of the co. is a line of new red sandstone hills. In the n.e. is part of the Lancashire coal-field. In the e. are large tracts of peat, and much of the co. is wet and rushy. The n.w. part of C. forms a hammer-headed peninsula called Wirral, about 8 m. broad, between the estuaries of the Dee and Mersey. Coal-measures appear on the w. side of this peninsula, as well as on the w. border of the main part of the county. The chief rivers are the Dee, Mersey, and Weaver, which are navigable. The Dee skirts the co. on the w. 55 m., and the Mersey on the n. for 40 miles. The Weaver rises in the e. part of the co., and runs 40 m. w.n.w. into the Mersey. The co. contains an almost unrivaled system of canals, including the celebrated Bridgewater canal, and is traversed by the main line of the London and Liverpool railway, and the Crewe, Chester, and Holyhead railway. The chief mineral products are rock-salt and coal. The rock-salt, discovered in 1670, and mined by gunpowder, is found near the Weaver and its branches, especially near Norwich, at the deph of 28 to 48 yards, in two beds, the upper one being 15 to 25 yards, and the lower one above 40 yards thick, under a stratum of hard rock, 25 to 35 yards thick. The mines, one occupying 35 acres, when lighted up, resemble a fairy palace sparkling with gems and crystal. Much salt is also made from brine-springs 20 to 40 yards deep. Coal is worked in the n.e. part of the county. There are also lead (with cobalt) and copper-mines, and in almost every part of the co. freestone, limestone, millstone, and marl are found. The climate is moist. The soil is mostly a clayey or sandy loam, with marl and peat, and very fertile. The soil and climate are well fitted for pasturing, dairy-farming, and cheese-making, which are the chief agricultural occupations. Arout 160,000 cows are kept in C., and the quantity of cheese annually produced is estimated at from 15,000 to 30,000 tons—the best being made on the strongest lands. The hedgerows abound in oaks. C. is a manufacturing as well as an agricultural county. Pop. in 1881, 643,237. The chief town are Chester (the co. town), Macclesfield, Stockport, Congleton, Knutsford, and Birkenhead. The co. of C. returns 6 members to parliament. C. has some Roman roads, tumuli, barrows, remains of religious houses, and many old castles and halls. The 12th Roman legion occupied Chester till the 3d century. Egbert, in 828, added C. to the Anglo-Saxon kingdom of Mercia. William the conqueror erected C. into a co. palatine, under Hugh Lupus, with an independent parliament and 8 barons. Henry VIII. subordinated it to the English crown; but C. did not send representatives to the English parliament till 1549, and the separate jurisdiction ceased entirely only in 1831.

CHESNE, André Du. See Duchesne, *ante*.

CHESNEY, Charles Cornwallis, 1826–76; a brevet-col. in the British royal engineers, who first attracted attention by *A Military View of Recent Campaigns in Virginia and Maryland*, published in 1863, which was followed two years later by *Campaigns in Virginia and Maryland*, both having reference to the war of the rebellion in the United States. The work from which he received the greatest fame at home was *Waterloo Lectures*. He published, also, *The Military Resources of Prussia and France; Recent Changes in the Art of War;* and *Essays in Modern Military Biography*.

CHESNEY, Francis Rawdon, 1789–1872, a British soldier who projected and led the Euphrates expedition by an overland route to India in 1835–6. He was a brig.gen. in China in 1843, maj.gen. in 1855, and gen. in 1868. He wrote *Expedition for the Survey of Euphrates and Tigris; Observations on the Past and Present States of Fire-arms; Russo-Turkish Campaigns of* 1828–29; and *Narrative of the Euphrates Expedition*.

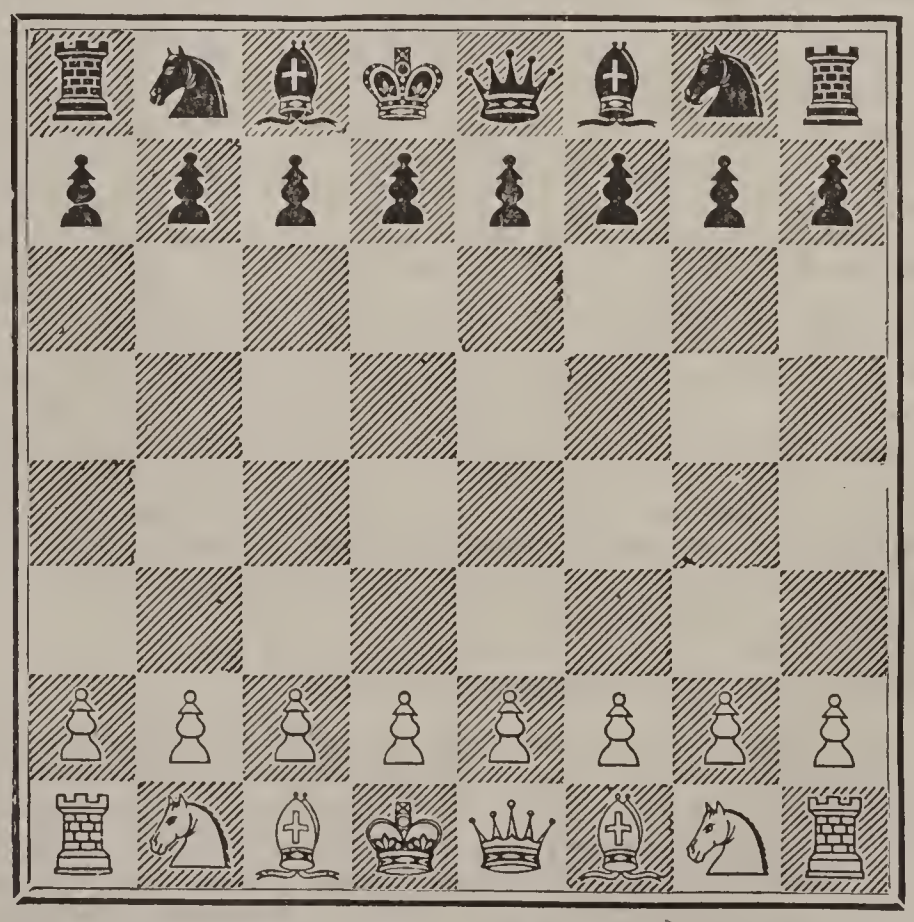
CHESS (Fr. *échecs*, Ger. *schach*). The origin of this, the most purely intellectual of all games of skill, has been much disputed; thus much may now be considered as certain, that, under the Sanscrit name of *chaturanga*, a game, essentially the same as modern C., was played in Hindustan nearly 5,000 years ago. In its gradual diffusion through the world in succeeding ages, the game has undergone many alterations and modifications, both in nature and in name; but marked traces of its early Asiatic origin and descent are still discerned by the learned in its nomenclature and other characteristics. From Hindustan, C. spread into Persia, and thence into Arabia. The Arabs, it would appear, in the 8th c., introduced the game into Spain and the rest of western Europe; and in England, chess-play seems to have been known prior to the Norman conquest. Into Constantinople, and probably some other cities of eastern Europe, the game may have been imported from Persia at a period earlier than its Moorish conveyance into Spain.

The original Hindu game was played on a board of sixty-four squares, as now, but by *four persons*, two being allied against two, as in whist. Hence the name *chaturanga*, from *chatur*, "four," and *anga*, "a member" or "component part." The name *shatranj*, used by the Persians and Arabs, is a corruption of the Sanscrit. The English, French, and other European names are derived from the Persian term *shah*, "king." *Check*, the warning when the king is in danger, is but another form of *shah;* in fact, "king" is sometimes used for "check," and in German *schach* is both the name of the game and the term of warning. The term *rook* is from the Sans, *roka*, Pers. *rukh*, meaning a ship or chariot; *pawn* is said to be from *peon*, an attendant, or foot-soldier.

The books written upon C. "would form a tolerably large library." Of works on the antiquities of the subject, we may mention Dr. D. Forbes's *History of Chess* (Lond. 1860). The best modern practical works on the art of chess-play are the *Chessplayer's Handbook; C. Praxis;* and *Chess: Theory and Practice*, by Staunton; Morphy's *Games at C.*, edited by Lowenthal; Jaenisch's *Treatise on the Openings*, translated by Walker; and Horwitz and Kling's *Collection of End-games.* The subject is also pretty fully treated in Chambers's *Information for the People*, "In-door Amusements."

The game of C. is played upon a square board marked out into sixty-four square divisions, which are colored alternately black and white, in order the more clearly to determine and denote the respective movements of the several pieces. In placing the board for play, each player must always have a *white* corner square at his right hand. There are two sets of pieces, of opposite colors, of sixteen men each, and of various powers according to their rank. These sets of men are arrayed opposite to each other, and attack, defend, and capture, like hostile armies. The accompanying diagram will best explain the name, form, and place of each man at the commencement of the game:

BLACK.



Rook. Knight. Bishop. Queen. King. Bishop. Knight. Rook.
WHITE.

The superior officers occupying the first row on each side are called *pieces;* the inferior men, all alike, standing on the row immediately in front of the pieces, are called *pawns.* Their moves and powers, along with the peculiar terms used in C., may be briefly described as follows:

A *pawn*, at his *first* move, may advance either one or two squares, straightforward; but after having once moved, he can only advance a single square at a time. In capturing* an adverse piece, however, a pawn moves one square diagonally, either right or left; but the pawn never moves backward. On arriving at an 8th square, or the extreme line of the board, a pawn may be exchanged for any piece his owner chooses to call for, except a king; so that a player may have several queens on the board at once. If, on moving two squares, a pawn pass by an adverse pawn which has arrived at the 5th line, the advanced adverse pawn may take the other *in passing* in exactly the same manner as if the latter had moved but one square.

A bishop moves any number of squares diagonally, but diagonally only; therefore a bishop can never change the color of his square.

A knight moves two squares, so as always to change color—that is, he moves one square forward or backward, and one diagonally. On account of this crooked movement, he can leap over or between any surrounding pieces; and therefore a knight's check—unless he can be taken—always compels the king to move.

The rook, or castle, moves any number of squares forward, backward, or sidewise, but not diagonally.

The queen is by far the most powerful of the pieces, and moves over any number of squares, either in straight lines or diagonals, forward, backward, or sidewise; so that her action is a union of that of the rook and bishop. At starting, the queen always stands on a square of her own color.

The king is the most important piece on the board, as the game depends upon his safety. He moves only one square at once, in any direction, except when he *castles*—a term to be explained presently. The king cannot be taken; but when any other piece attacks him, he is said to be in *check*, and must either move out of check or interpose some one of his subjects, unless the checking piece can be captured. When there is no means of rescuing the king from check, he is said to be checkmated, and the game is over. Of course, the two kings can never meet, as they would be in check to each other. *Double-check* is when a piece, by being moved, not only gives check itself, but also discovers a previously masked attack from another.

Castling is a privilege allowed to the king once in a game. The move is performed either with the king's rook or queen's rook—in the former case, the king is moved to the king's knight's square, and the king's rook is placed on the king's bishop's square; in the latter case, the king is played to the queen's bishop's square, and the queen's rook is played to the queen's square. But the king cannot castle after having once moved, nor at a moment when he is actually in check, nor with a rook that has moved, nor when he passes over a square attacked or checked by an adverse piece, nor when any piece stands between him and the rook with which he would castle, nor when in the act of castling either the king or rook would have to capture an adverse piece.

A *drawn* game results from neither player being able to checkmate the other: thus, a king left alone on each side must of course produce a draw, as do also a king with a bishop, or a knight, against a king.

Stalemate, or the not being able to move either the king or any other piece, also constitutes a drawn game.

Odds is a term applied to the advantage which a stronger player should give to a weaker: thus, the removal of a rook or knight from the better player's forces may be fair odds; or if the players are more nearly matched, the one may give a pawn. When the odds of a pawn are given, it is always understood to be the king's bishop's pawn.

Gambit is a technical word implying the sacrifice of a pawn early in the game, for the purpose of taking up an attacking position with the pieces.

Supposing the worth of a pawn to be represented by unity, the following is a tolerable average estimate of the comparative value of the pieces: Pawn 1, bishop 3, knight 3, king 4, rook 5, queen 9.

The chess-men being placed, the players begin the engagement by moving alternately; each aiming to gain a numerical superiority by capturing his opponent's men, as well as such advantages of position as may conduce to victory.

The rows of squares running straight up and down the board are called *files*, those running from side to side are called *lines*, and those running obliquely across are termed *diagonals*.

The playing over the following short game will serve the learner as a little initiatory practice:

WHITE.	BLACK.
1. King's Pawn two.	1. King's Pawn two.
2. King's Bishop to Queen's Bishop's 4th.	2. King's Bishop to Q Bp's 4th.
3. Queen to King's Rook's 5th.	3. King's Knight to K Bp's 3d.
4. Queen takes King's Bishop's Pawn, giving Black checkmate.	

* Taking is always performed by lifting the captured man from the board, and placing the captor on his square. The pawn is the only man whose mode of taking differs from his ordinary move.

The foregoing brief mode of giving a checkmate is called the *Scholar's mate*, and is often practiced upon young and unwary players. Any contractions used, such as "K" for king, "B" for bishop, etc., will readily be understood by the use of the diagrams.

In the conduct of the game, and in the practice of C., the following rules, precepts, and hints will be found very generally useful:

Play forth your minor pieces early, and castle your king in good time. You may sometimes delay castling with advantage, but not often.

Do not expect to be able to establish an enduring attack with half your forces at home.

Seek to let your style of play be attacking; and remember the gaining or losing of time in your measures is the element of winning or losing the game.

Never touch a piece without moving it, nor suffer yourself or your opponent to infringe any other of the laws of the game.

You will find, when first player, that the opening, springing from your playing 1st king's pawn two, and then your king's knight to the bishop's 3d, is one of the best that you can adopt; but do not adhere to any one opening only.

If you wish to adopt a purely defensive opening, you may play 1st king's pawn one, and follow up with Q P 2, and Q B P 2.

Next to playing with good players, nothing will conduce to improvement more than looking on at two expert players whilst they play. Wanting these advantages, it is best to play over openings, and actual games, from books or journals.

To prevent blunders and oversights, always endeavor to perceive the motive of your adversary's move before you play; and look often round the board to see that you are not losing sight of any better move than the one you intended, or that you are not suffering yourself to be tempted by a bait.

When an onlooker, never interfere.

Always endeavor to lose with good temper, and to bear your adversary's faults with a good grace.

The Laws of Chess.—The laws of C. are at present in a somewhat unsettled, unsatisfactory condition; but the following are the principal prevailing regulations of the game:

1. If any error have been committed in the placing of the board or men, either player may claim that the game shall be finished as it stands, after four moves have been completed on each side, but not else.

2. A move once made, by your having moved a piece and left hold of it, cannot be retracted.

3. If you touch a piece, you must play that piece; but as long as you retain your hold, you can play it where you like. If you touch a piece that cannot move, your opponent may compel you to play your king, unless the king be unable to move. When you touch your pieces for the mere purpose of adjusting them, you are bound to say so.

4. If you make a false move, your opponent may either cause you to retract it and move your king, or he may claim that the false move shall stand, or that you shall make a legal move with the same piece, at his pleasure.

5. If you touch one of your opponent's men, he may compel you to take that man; or if that be impossible, to move your king, provided he can move without going into check.

6. If on the king being checked, due notice is not given, the player whose king is attacked is not bound to notice it.

7. In every fresh game, except when one is drawn, the first move alternates.

8. Drawn games counting as no games at all, the player who had the first move in a drawn game is also entitled to it in the next. (This absurd regulation is fast becoming obsolete; and it is now a common agreement in playing a series of games, that the move shall invariably alternate.)

9. A player who gives the odds of a piece, is entitled to the first move.

10. The time for consideration of a move is not limited; but a player leaving a game unfinished without his opponent's permission, loses such game.

11. When at the end of a game one player is left with just sufficient superiority of force to win—such as a king and rook against king, king and two bishops, or king, knight, and bishop against king—he who has the greater force must give checkmate within fifty moves on each side, or else the game is adjudged to be drawn. This law is framed to prevent unskillful players from wearying their opponents by persisting in the attempt to accomplish what they are too untutored to effect; and it is perfectly just, since the allotted number of moves is amply large enough and to spare.

12. In case of any dispute about the laws, both players are to agree as to an umpire, whose decision is to be considered final.

As there is no branch of chess-study better calculated to advance the skill of a learner than the attentively playing over recorded games between first-rate players, we have given an example of a game played blindfold, simultaneously with five other games, by the celebrated American chess-player, Paul Morphy. This gentleman visited England and the continent of Europe in 1858, and in his contests with the best players fairly carried all before him, so that he soon ranked as the greatest chess-player living.

White—Mr. Morphy.	Black—Mr. C——.
1. P to K 4.	1. P to K 4.
2. K Kt to B 3.	2. Q Kt to B 3.
3. K B to Q B 4.	3. K B to Q B 4.
4. P to Q Kt 4.	4. B takes Kt P.
5. P to Q B 3.	5. B to Q R 4.
6. P to Q 4.	6. P takes P.
7. Castles.	7. P takes P.
8. Q B to R 3.	8. P to Q 3.
9. Q to Q Kt 3.	9. K Kt to R 3.
10. Q Kt takes P.	10. K B takes Kt.
11. Q takes B.	11. Castles.
12. Q R to Q.	12. Kt to K Kt 5.
13. P to K R 3.	13. K Kt to K 4.
14. Kt takes Kt.	14. Kt takes Kt.
15. B to K 2.	15. P to K B 4.
16. P to K B 4.	16. Kt to Q B 3.
17. K B to B 4, ch.	17. K to R.
18. Q B to Kt 2.	18. Q to K 2.
19. Q R to K.	19. R to B 3.
20. P takes P.	20. Q to K B squ.
21. R to K 8.	21. Q takes R.
22. Q takes R.	22. Q to K 2.
23. Q takes Kt P, ch.	23. Q takes Q.
24. P to K B 6.	24. Q takes Kt P, ch.
25. K takes Q.	25. B takes P, ch.
26. K takes B.	26. P to K R 4.
27. R to K Kt, and wins.	

CHESS, or CHEAT, common names of the *bromus secalinus*, a plant of the order *graminaceæ;* a troublesome weed that frequently springs up in wheat-fields, the seed mixing with the true wheat, from which it can be separated only with difficulty. It was once generally believed among farmers that wheat itself was transmuted into chess.

CHEST, MILITARY, is a technical name for the money and negotiable securities carried with an army, and intended to defray the current expenses. In the English military system, this department is managed by the commissariat.

CHEST, NAVAL. The name of C. has been given to certain funds, maintained for the benefit of seamen belonging to the royal navy. A fund, called the *Chest at Chatham*, was suggested so long ago as the days of Drake and Hawkins, for the relief of wounded and superannuated seamen. In 1590, all seafaring men in queen Elizabeth's service consented to a stoppage out of their pay of 2*d.* to 6*d.* per month, to support this fund. The money was not in those days, as it would be now, put out to interest; it was kept in a C., and hence the name given to the fund itself. During the 18th c., the system became organized in a better manner; but still the fund retained the name of C.; insomuch that when the office was removed from Chatham to Greenwich, in 1803, it became the *Chest at Greenwich.* The C. is managed *ex officio*, and the accounts are annually laid before parliament. Handsome gifts are occasionally made to the fund by individuals. Disabled sailors receive a present sum of money, if not deprived of the power of earning a living; but if their injuries are more permanent, they receive a pension from the C., for one year, or for several years, or for life, paid half-yearly.

CHEST, or THO'RAX, in anatomy, is the part of the body which lies beneath the neck and above the abdomen (q.v.), constituting the uppermost of the two divisions of the trunk, or that which contains the heart and lungs, and is bounded externally by the ribs. The C. is somewhat conical in form, the broad or lower end of the cone being shut in by the diaphragm, a large muscular partition which projects upwards from the lower ribs, being convex towards the C., and concave towards the abdomen. In respiration (q.v.), the diaphragm descends by its own muscular contraction, while at the same time the ribs are drawn upwards and outwards by the intercostal muscles. The cavity of the C. is thus enlarged, the lungs are expanded, and air is drawn into them through the trachea or windpipe and bronchi. See LUNGS. The combination of bone, cartilage, muscle, and tendon entering into the composition of the C. is such as to permit of expansion-movement to the extent required, and yet to guard against over-expansion, which would be fatal to the delicate textures within. The bones of the C. are at the same time a powerful protection against external injury.

The structures forming the walls of the C. are: 1. The backbone or spinal column, divided into 24 vertebræ, 12 of which, called the dorsal vertebræ, form the thoracic portion. 2. Twelve ribs, attached to the transverse processes or projecting portions of the dorsal vertebræ, and ending in front in the costal cartilages, by which the ribs are connected with. 3. The sternum or breast-bone, which occupies the middle line. 4. The diaphragm (q.v.). See also SKELETON.

The contents of the C. are the heart, the great arteries and veins, the lungs, the

trachea or windpipe, the bronchi or branches of the trachea, leading to the lungs, the œsophagus or gullet, and the thoracic duct (q.v.), or general terminus of the lymphatic system of vessels, by which the chyle and lymph are discharged into the blood. The very great importance of these parts to life, and their great liability to deranged action, renders the C. the seat of a large proportion of the diseases which afflict humanity, and especially of those which end in death. Indeed, of the three organs which the great physiologist, Bichat, called the "tripod of life"—viz., the brain, heart, and lungs—the C. contains two; hence its condition in almost all diseases, and especially in fatal diseases, is an object of the utmost solicitude to the physician.

The diseases of the C. depend in some cases on alterations in its form, as by rickets (q v.) and other diseases affecting the bones in early childhood or in youth, as by too tight lacing in girls. The lungs and air-tubes are subject to a great variety of diseases, among which the principal are consumption or phthisis pulmonalis, pneumonia, pleurisy, bronchitis or pulmonary catarrh. The heart is subject to pericarditis, endocarditis, and chronic organic disease of the valves, as well as to enlargement (hypertrophy), dilatation, and degenerations of its muscular texture. The aorta, or great artery, is often affected with degeneration of its walls, and occasionally with aneurism. The great veins are liable to over-distension, and to obstruction by tumors or by coagulation of the contained blood. The thoracic duct is also sometimes obstructed by external pressure; and the œsophagus has a number of diseases usually described in connection with the alimentary canal. Most of the diseases here referred to are described either under special articles, or under Lungs and Heart.

The examination of the C. by physicians is now conducted not only by an investigation of the symptoms or obvious characters of the disease, but by a minute and elaborate examination into the physical condition of the contained organs by means of auscultation (q.v.), percussion (q.v.), measurement, etc. The application of these methods is too complicated and technical for explanation in detail, but their results will be shortly alluded to incidentally in the articles above referred to on the diseases of the chest. The name of Laennec (q.v.) will be long remembered in medicine as that of a great original observer, who has contributed more than any other to the progress of knowledge in this department.

CHESTER, a co. in s.e. Pennsylvania, on the Delaware and Maryland borders, traversed by the Pennsylvania Central, Philadelphia and Baltimore, Philadelphia and Reading, and other railroads; 738 sq.m.; pop. '80, 83,480. The soil is rich and is thoroughly cultivated, producing wheat, corn, oats, potatoes, hay, butter, wool, etc. There are deposits of chromate of iron, gneiss, porcelain clay, sandstone, copper, lead, iron, and occasionally zinc, agate, amethyst, silver, titanium, zircon, sapphire, and beryl are found. The historical Valley Forge is in the co., which also contains the birthplace of Anthony Wayne. Co. seat. West Chester.

CHESTER, a co. in n. South Carolina, between the Catawba and Broad rivers, traversed by the Charlotte, Columbia and Augusta, and the King's Mountain railroads. The surface is uneven, soil fertile. Pop. '80, 24,153—16,517 colored. Co. seat, Chesterville.

CHESTER, a city in Delaware co., Penn., on the Delaware river and the Philadelphia and Wilmington railroad; 10 m. s.w. of Philadelphia; pop. '80, 14,997. C. is the oldest town in the state, having been settled by Swedes in 1643. William Penn's provincial assembly was held in Chester, and it was the co. seat of Chester co. until Delaware co. was set off in 1789.

CHESTER, an ancient and episcopal city, municipal and parliamentary borough, and river-port, the capital of Cheshire, on the right bank of the Dee, 22 m. from the mouth of its estuary, 16 m. s.c. of Liverpool. It stands on a rocky sandstone height, and is mostly inclosed in an oblong quadrangle of ancient walls, 7 or 8 ft. thick, nearly 2 m. in circuit, and with 4 gates, and now forming a promenade with parapets, where two persons can walk abreast. The two main streets cross each other at right angles, and were cut out of the rock by the Romans 4 to 10 ft. below the level of the houses. The houses in these streets are curiously arranged; the front parts of their second stories, as far back as 16 ft., form a continuous paved promenade or covered gallery, open in front where there are pillars and steps up from the street below, with private houses above, inferior shops and warehouses below, and the chief shops of the town within. This arrangement, called the "rows," together with the ancient walls, and the half-timbered construction of many of the houses, with quaintly carved ornamented gables of the 16th c., render C. perhaps the most picturesque city in England. C. cathedral is an irregular massive structure of crumbling sandstone, 375 by 200 ft., with a tower of 127 feet. It was formerly the church of the abbey of St. Werburgh, and for 650 years was one of the richest in England. St. John's church, now partially in ruins, is supposed to have been founded by Ethelred in 698. The Dee is crossed by a superb stone arch of 200 ft. span. Suburbs of villas have recently arisen outside the walls; and a public park, presented by the marquis of Westminster, was opened in 1867. The C. railway station is the center of several important railways, and is one of the largest and finest in the kingdom. C. has manufactures of lead, iron-foundries, chemical works, and an iron-ship-building yard. The chief exports are cheese, copper, cast-iron, and coal. C. has many charitable and religious institutions, and is the abode of many wealthy families. Pop.

'81, 36,788. The city is a county in itself, and returns two members to parliament. In 1875, 3,550 vessels, of 218,368 tons, entered and cleared, but the silting up of the mouth of the Dee is against the shipping trade.

C. was *Devana Castra*, or Colonia Devana, an important Roman station, and has yielded many Roman remains—as masonry, coins, inscriptions, fibulæ, altars, a hypocaust, and a statue of Pallas. C. was only in 828 taken by the Saxons from the Britons. Its strength made it a refuge against the descents of the Danes and Northmen, but the Danes took it in 894. Ethelfrida retook it in 904, and rebuilt the walls. From the Norman conquest to the time of Henry III., the earls of C. had their own courts and parliaments at C., with 8 subfeudatories and the superiors of the great religious houses, C. being then a county palatine. Henry III. made his eldest son earl of C., a title held since by the prince of Wales. Llewelyn ravaged C. in 1255. The 25 famous C. mysteries or religious plays by Randle, a monk (1250–60), were acted in the church. After a long siege, the parliamentary forces defeated those of Charles I. at C., and took the city. Pearson and Porteus were bishops of Chester. Trinity church contains the remains of Matthew Henry, the Biblical commentator. The commerce of C. has steadily declined since the rise of Liverpool.

CHESTERFIELD, a co. in n.e. South Carolina. intersected by the Cheraw and Darlington railroad; 868 sq.m.; pop. 80, 16,345—6846 colored. Productions chiefly agricultural. Co. seat, Chesterfield Court House.

CHESTERFIELD, a co. in s.e. Virginia, between the Appomattox and the James river, traversed by the Richmond and Petersburg, and the Richmond, Danville, and Piedmont railroads; 300 sq.m.; pop. '80, 23,773—10,538 colored. Coal is abundant, but agriculture is the chief business, and corn and tobacco are the principal crops. Co. seat, Chesterfield Court House.

CHESTERFIELD, a municipal borough in Derbyshire, near the Hipper and Rother rivulets, 24 m. n.n.e. of Derby by rail. There are manufactures of leather, silk, lace, earthenware, and machinery; and there are several blasting-furnaces in the neighborhood. The manufactures are increasing rapidly, and the minerals in the neighborhood, including coal, iron, potters' and brick clay, slates, and lead, are being greatly developed. The population was, in 1851, 7,100; in 1881, 12,221. Trade is facilitated by a canal connecting C. with the Trent, and by the main line of the Midland railway.

CHESTERFIELD, Earl of (Philip Dormer Stanhope), an English statesman and author, eldest son of the third earl of C., was b. in London, Sept. 22, 1694, and studied at Cambridge. In 1714, he made the tour of Europe, and the following year was appointed a gentleman of the bedchamber to the prince of Wales. About the same time, he was elected M.P. for St. Germains, in Cornwall. In 1726, on his father's death, he becamc earl of C., and in 1727 was sworn a privy-councillor. In 1728, he was appointed ambassador extraordinary to Holland, and in 1730 was made a knight of the garter and lord steward of the household, but soon resigned that office. An eloquent and frequent speaker, he took an active part in all the important business in the house of lords, and was for several years the strenuous opponent of sir Robert Walpole, then premier. In 1744, he connected himself with the administration, and in 1745 was reappointed ambassador to the Hague, but was soon nominated lord-lieut. of Ireland, where he rendered himself exceedingly popular. In Oct., 1746, he became one of the principal secretaries of state, but, two years after, declining health caused him to resign office, and in 1752 he was seized with deafness. Distinguished by brilliancy of wit, polished grace of manners, and elegance of conversation, he lived in intimacy with Pope, Swift, Bolingbroke, and other eminent men of the day. Dr. Johnson, whose dictionary, on its appearance, he affected to recommend, called him "a wit among lords, and a lord among wits." He wrote several papers, on temporary subjects, in *The Craftsman*, *The World*, periodicals of the time; but he is now best known by his *Letters to his Son*, Philip Dormer, written for the improvement of his manners. These letters have been often republished. and they afford a good idea of the mental and moral caliber of the author. Lord C. died Mar. 24, 1773.

CHESTERFIELD INLET, a long and narrow gulf, penetrating to the westward from the n.w. of Hudson's bay. Its extreme dimensions are 250 and 25 m.; and the lat. and long. of its mouth are 63° 30′ n., and 90° 40′ west. C. I. is studded nearly throughout with islands.

CHESTNUT, *Castanea*, a genus of plants of the natural order *cupuliferæ*, closely allied to the beech (*fagus*), and distinguished from it by long male catkins, longitudinally set with groups of flowers, a 5 to 8-celled ovary, and compressed rounded nuts. The name is derived from the town of Castanum, near Magnesia, in Asia Minor. The Common C., Spanish C., or Sweet C. (*C. vulgaris*), is said to have been first brought from Asia Minor to Sardinia, and from thence to have gradually extended over the s. of Europe, where it has long been naturalized, and forms extensive woods. It is an ornamental, stately, or, in exposed situations, a very spreading tree, of great size and longevity; the still surviving C. of Totworth in England was known as a boundary-mark in the reign of king John. A celebrated C. tree on Mt. Etna measured 204 ft. in circumference of trunk. The C. has oblongo-lanceolate, acuminate, serrated, smooth leaves. The timber is dura-

ble and hard, and is used in house-building, for making furniture, and for many other purposes. The timber of the C. so much resembles that of the oak, as in old buildings to be distinguished with difficulty. The bark is used for tanning, but is worth only about half the price of oak-bark. Young C. trees are much esteemed for hop and espalier poles. The C. is therefore frequently grown in England as coppice-wood; but it succeeds well as a timber-tree even in Scotland, although it does not generally ripen its fruit. In Devonshire, however, and in some other parts of England, it is planted to a considerable extent as a fruit-tree. It succeeds throughout all the middle latitudes of Germany, but dislikes a damp foggy atmosphere. It prefers a dry light soil, and succeeds only where there is a dry subsoil. The nuts are generally two in each husk. They form a principal part of the food of the poor in the s. of Europe, being used either roasted or boiled, and often ground into flour, and made into a kind of bread. They contain 15 per cent of sugar, and by pressure yield a sugary juice, which readily undergoes the vinous fermentation, and from which a crumb-like kind of sugar may be obtained. The best kinds of chestnuts are called by the French *marrons*. When cultivated as a fruit-tree, the C. is generally grafted, by which means the better varieties are secured. —Other species of C. also bear eatable fruits: those of the AMRICAN C. (*C. Americana*), a tree much resembling the commonC., and of the DWARF C., or CHINQUAPIN (*C. pumila*), a low tree, or more generally a shrub of 7 to 8 ft. high, are used in America. The fruit of the dwarf C. is of the size of a common hazel-nut; the nut is convex on both sides. The plant reaches its southern limit on the banks of the Delaware.—A number of species are natives of the east. The inhabitants of the mountains of Java eat the fruit of the SILVERY C. (*C. argentea*), and the TUNGURRUT (*C. tungurrut*), boiled or roasted, like the common chestnut. Both of these are large trees, the tungurrut reaching a height of 150 ft.—The horse C. (q.v.) is entirely different from the true chestnut.

CHESUN'COOK LAKE, an expansion of Penobscot river in Piscataquis co., Me., about 24 m. long by 2 to 4 m. wide.

CHEVALIER (Fr. *cheval*, a horse), in heraldry, a horseman armed at all points. In its more general acceptation it signifies a knight (q.v.). See also BANNERET and CHIVALRY.

CHEVALIER, MICHEL, an eminent French economist, born at Limoges, Jan. 13, 1806, was at the age of 18 admitted a pupil of the polytechnic school. Thence he went to the school of mines, and some days before the revolution of July, he was attached as an engineer to the department du Nord. Led away by the theories of the St. Simonians, he was for two years editor of the *Globe*, the organ of that sect. Joining the schism of M. Enfantin, he took an active part in the compilation of the *Livre Nouveau*, the standard of their doctrines, and in 1832 suffered six months' imprisonment, on account of his free speculations in regard to religious and social questions, being regarded as an outrage on public morals. On his liberation, he at once retracted all that he had written in the *Globe* contrary to Christianity, and against marriage, and obtained from M. Thiers a special mission to the United States, to inquire into the systems of water and railway communication there. The results were published in his *Letters from North America* (1836, 2 vols. 8vo). After a visit to England, he issued a work, entitled *Material Interests in France: Public Works, Roads, Canals, Railways* (1838, 8vo). He was named, successively, chevalier of the legion of honor, councilor of state (1838), a member of the superior council of commerce, and of the royal council of the university; and in 1840, professor of political economy in the college of France. In 1840, he was re-established in the corps of mines as engineer of the first-class; and in 1846, elected a member of the chamber of deputies. Under the republic, he lost his various employments. He published, in 1848, *Letters on the Organization of Labor and the Question of the Laborers;* and after the *coup d'état* of Dec. 2 was restored to his professorship, and named councillor of state. In 1860, C. assisted Mr. Cobden in carrying into effect the commercial treaty between France and England, and was created a senator. He became a grand officer of the legion of honor, 1861. Besides the works mentioned,we may include *Political Economy* (1842–50); *Probable Fall of the Value of Gold* (1859—translated by Cobden); *Mexico, Ancient and Modern* (1863); etc. He d. 1879.

CHEVAUX-DE-FRISE, in fortification, is a hastily constructed substitute for a regular abattis, to stay the progress of an advancing enemy. It may be constructed in any way of wood or iron, provided it presents an array of sharp or ragged points towards the enemy. Sometimes it is made of barrels or centers of timber, with spears springing out from all sides, in such a way as to constitute both a support and a defense. Among the *matériel* of an army under the care of the engineers, are sometimes comprised chevaux-de-frise formed of cylindrical iron barrels, about 6 feet long, each having 12 holes to receive as many spears; the spears can be packed away in the barrel, when not in use. Each such piece constitutes a *cheval;* and many such, ranged end to end, form *chevaux*, to be used in ditches around a fortification, on the berme beneath the parapet, behind the glacis, across a breach in the rampart, or in any spot where a check to the storming-party is needed. At Badajoz, during the peninsular war, great service was rendered by a chevaux-de-frise formed of sword-blades fixed into beams of wood. The name is said to have been derived from "Friesland horse," and to have been first applied by the French during the wars of the 17th century.

CHEV'ERUS, Jean Louis Anne Madeleine Lefebvre de, D.D., 1768–1836; the first Roman Catholic bishop in New England. He was raised to the priesthood in 1790, and had a curacy at Mayence, in France; but on refusing to take the oath required by the assembly he went to England, and in 1795 came to America and joined the Roman Catholic mission in Boston. He spent some months in Maine as an Indian missionary. During the prevalence of the yellow fever in Boston his faithful and efficient service, without regard to sect or belief, made him remarkably popular, and when he started a subscription for funds to build a church of his faith, John Adams, then president of the United States, headed the list. In 1808, he was made bishop against his own protest. In 1823, he was recalled to France, and made bishop of Montauban, and still later bishop of Bordeaux and peer of France. He was appointed a cardinal Feb. 1, 1836. Six months afterward he died suddenly from apoplexy.

CHEVES, Langdon, LL.D., 1776–1857; a native of South Carolina; elected to the state assembly in 1808; and to congress in 1811, serving five years, for a part of the time being speaker of the house, in which position he gave the casting vote that defeated the rechartering of the U. S. bank; but in 1819 he became president of the same bank. He was chief commissioner in settling some of the provisions of the treaty of Ghent. In 1850, he was a delegate to the Nashville national convention, and in 1852, a member of the South Carolina state convention, in which he opposed a separate state secession.

CHEVIOT HILLS, a mountain-range occupying contiguous parts of the counties of Northumberland and Roxburgh, on the English and Scotch borders, and running 35 m. from near the junction of the Till and Tweed, in the n.e., to the sources of the Liddel, in the s.w. The highest points are C. hill, 2,684 ft., and Carter Fell, 2,020. West of Carter Fell, these hills chiefly consist of carboniferous sandstone and limestone, with protrusions of trap. The e. portion of the range is porphyritic, and includes higher and more or less conical hills. In the C. H. are the sources of the Liddel, Tyne, Coquet, and some of the branches of the Tweed. Grouse abound, and the golden eagle is seen. These hills afford pasture for the Cheviots, a superior breed of sheep. They have been the scene of many bloody contests between the English and Scotch.

CHEVRETTE'. See Gyn.

CHEVREUL, Michel Eugène, a distinguished French chemist, b. Aug. 31, 1786, at Angers, in the department of Maine-et-Loire. In 1820, he was made an examiner in the polytechnic school; and in 1824, director of the dyeing department in the manufactory of the Gobelins. This last position led him to institute a series of accurate researches on colors, the results of which he made known in a series of *Mémoires* of the academy of sciences. Previous to this, C. had made himself known in the scientific world by a variety of researches and writings. In 1826, he was made a member of the academy; and in 1830, professor of applied chemistry in the museum of natural history. Besides a great number of articles in the *Journal des Savants,* beginning with 1820, the following works of C. deserve mention: *Leçons de Chimie appliquée à la Teinture* (1828–31); *De la Loi du Contraste simultané des Couleurs et de l'Assortiment des Objets coloriés* (1839); *Théorie des Effets Optiques que présentent les Etoffes de Soie* (1846); *De la Baquette divinatoire, du Pendule, et des Tables tournantes* (1854); *Des Couleurs et de leur Application aux Arts Industriels* (1864); and a work on a new organic acid, *L'Acide Avique* (1871). C. is a fellow of the royal society of London, and a commander of the legion of honor.

CHEVREUSE, Marie de Rohan Montbazon, Duchesse de, 1600–79; a native of France, married first to the duc de Luynes, and next to Claude de Lorraine, duc de Chevreuse. Her friendship for Anne of Austria made Richelieu her enemy, and he resolved to have her arrested; but, learning of his purpose, she dressed in male attire, swam across the Somme, and escaped to England. She was concerned in other political intrigues, and was kept in banishment nearly all her life.

CHEV'RON, in heraldry, an ordinary representing the couples or rafters of a house, and supposed to betoken the accomplishment of some memorable work, or the completion of some business of importance, generally the foundation of his own family by the bearer. The C. is formed of two lines placed pyramidically, i.e., joined together at the top, and descending to the extremities of the shield in the form of a pair of compasses. *Chevronel,* a diminutive—half the size—of the chevron. *Per chevron,* or *party per chevron,* is where the shield is divided by a line in the form of the chevron.

CHEVRON, in architecture, a molding in the form of a succession of chevrons, otherwise called a zigzag molding. In general, it is characteristic of Norman architecture, but is also found with the pointed arch, during the transition period from Norman to early English.

CHEVRONS are braids or bands of lace, worn as distinguishing marks by the non-commissioned officers of regiments. The corporals, and the various grades of sergeant, have C. varying from one to four in number, either of white or of gold lace. In most corps, they are worn on the right arm only; but in the guards, the fusileers, the light infantry, and the grenadier and light infantry companies of the ordinary regiments, on both arms.

CHEVY CHASE, the name of perhaps the most famous of British ballads. In its present form, the piece does not seem to be older than about the beginning of the 17th century. But more ancient versions, doubtless, existed; and bishop Percy has published a poem of the 16th c., which has obviously suggested passages in the more recent composition. It is impossible to reconcile its incidents with history, but the event which is meant to be commemorated appears to have been the battle of Otterburn, in Aug., 1388—a fight which Froissart declares to have been the bravest and most chivalrous which was fought in his day. According to the ballad, Percy vowed that he would enter Scotland, and take his pleasure for three days in the woods of his rival, and slay the deer therein at will. Douglas, when he heard the vaunt, exclaimed, "Tell him he will find one day more than enough." Accordingly, at the time of the hay-harvest, Percy, with stag-hounds and archers, passed into the domains of his foe, and slew a "hundred fallow-deer and harts of grice." When the English had hastily cooked their game, and were about to retire, earl Douglas, clad in armor, and heading his Scottish spears, came on the scene. Haughty challenge and defiance passed between the potentates, and the battle joined. In the center of the fray the two leaders met: "Yield thee, Percy!" cried Douglas. "I will yield to no Scot that ever was born of woman!" cried Percy. During this colloquy, an English arrow struck Douglas to the heart. "Fight on, my merry men!" cried he, as he died. Percy, with all the chivalrous feeling of his race, took the dead man by the hand, and vowed that he would have given all his lands to save him, for a braver knight never fell by such a chance. Sir Hugh Montgomery, having seen the fall of Douglas, clapped spurs to his horse, dashed on Percy, and struck his spear through his body a long cloth-yard and more. Although the leaders on both sides had fallen, the battle, which had begun at break of day, continued till the ringing of the curfew-bell. Scotsmen and Englishmen claim the victory. When the battle ended, representatives of every noble family on either side of the border lay on the bloody greensward.

CHEWINK, the popular name for the ground robin, or towhee bunting, *pipilo erythrophthalma.* It is of variegated colors, red, white, and brown, is about 7 or 8 in. long, nests on the ground, and flies with a peculiar jerky motion. It lives in thickets, and finds its sustenance in seeds and worms scratched up from leaves and grasses.

CHEYENNE: co. Dak. See page 895.

CHEYENNE: co. Kan. See page 895.

CHEYENNE, a co. in s.w. Nebraska, on the Colorado and Wyoming border, intersected by the n. and s. forks of the Platte; 6,000 sq.m.; pop. '80, 1558. The Union Pacific railroid passes through the s. part. Co. seat, Sidney.

CHEYENNE, a city in Laramie co., Wyoming, the capital of the territory, on the Union Pacific railroad, where it is joined by the Denver Pacific, 516 m. w. of Omaha and 1400 m. e. of San Francisco; pop. 1880, 3,456. The town is on a broad open plain, 6,000 ft. above tide, and the streets are wide and regular. It is connected by rail with Denver, 106 m. s. of Colorado. The main business is in receiving and distributing supplies for Indian agencies and government forts. There are, however, several manufactories, and a rapidly growing general business. The place was first settled in 1867, when the Union Pacific railroad reached that point. In 1869, a large portion of the city was destroyed by fire.

CHEYENNES, an Indian tribe of the Algonquin family, once residing on and near the Cheyenne river, a tributary of the Red river of the North. Driven away by the Sioux, they retired beyond the Missouri, and about the beginning of the century they were further driven to the Black Hills region. In 1825, the first treaty with them was made by gen. Atkinson. Since then many treaties have been made, and almost all of them immediately broken by the whites, and constant trouble has been the result. The fearful and cold-blooded massacre of nearly a hundred men, women, and children of this tribe, by col. Chivington, of Colorado, in Nov., 1864, led to war that cost the U. S. government $40,000,000, and so embittered the Indians that a permanent peace can hardly be looked for. In 1867, gen. Hancock burned some of the villages, and began or rather continued a state of war, in the course of which gen. Custer defeated them at Washita, where Black Kettle, a chief, and two or three dozen squaws and pappooses were killed. The revenge taken upon Custer a few years later will not soon be forgotten. In '77, the Cheyennes were removed to the west part of the Indian territory where, in common with the Arapohoes, they occupy a reservation of 6,715 sq. m They numbered, '82, about 3,600.

CHEYNE, GEORGE, an eminent Scottish physician, b. in Aberdeenshire in 1671, was at first intended for the church, but, preferring the medical profession, studied at Edinburgh, under the celebrated Dr. Pitcairn. In 1700, after taking the degree of M.D., he repaired to London, where he practiced in winter, and in Bath in summer. From full living he became enormously fat, as well as asthmatic, and resolved on strictly adhering to a milk and vegetable diet, from which he derived so much benefit that he recommended it in all his principal medical treatises. In 1702, he published *A New Theory of Fevers*, and, in 1703, a work *On Fluxions*, which procured him admission into the royal society. Among his other works are: *Philosophical Principles of Natural Religion*, 1705; *Observations on Gout*, 1722; *Essay on Health and Long Life*, 1725; *The English Malady*—

a Treatise on Nervous Disorders, 1733; *Essay on Regimen*, 1739; *Account of Himself and of his various Cures*, 1743. Dr. C. died at Bath, April 12, 1743.

CHHATISGARH, a division of British India under the jurisdiction of the commissioner of the central provinces, comprising the districts of Ráipur, Biláspur, and Sambalpur, and seven small feudatory states, between 16° 50′ and 23° 10′ n., and 80° 30′ and 83° 15′ e.; 36,467 sq.m.; pop. '72, 3,289,043, of whom 2,054,874 were Hindus, 26,046 Mohammedans, 243 Buddhists, 451 Christians, and 1,207,429 aboriginal tribes of religion not specified. Two large rivers, the Nerbuddha and the Son, rise in the n.e. corner of the division, the former running nearly w. to the Bombay coast, and then falling into the Ganges in lower Bengal. The division is also called Chutteesgurh.

CHHINDWARA. See CHINDWARA, *ante*.

CHIABRERA, GABRIELLO, an Italian poet, b. at Savona, 8th June, 1552. He was educated at Rome under the care of his uncle, after whose death he entered the service of cardinal Cornaro, but was obliged to leave it in consequence of the revenge he had taken on an Italian nobleman who had done him an injury. In his 50th year he married, and remained independent for the rest of his life. He died 14th Oct., 1637. C.'s poetical faculty developed itself late. Having commenced to read the Greek writers at home, he conceived a great admiration of Pindar, and strove successfully to imitate him. He was not less happy in catching the naïve and pleasant spirit of Anacreon; his canzonetti being distinguished for their ease and elegance, while his *Lettere Famigliari* was the first attempt to introduce the poetical epistle into Italian literature. C. also wrote several epics, bucolics, and dramatic poems. His *Opere* appeared at Venice, in 6 vols., 1768.

CHIA′NA (in ancient times, *Clanis*), a river in Tuscany, formed by several streams from the Apennines, and falling into the Arno a few miles below Arezzo. Along with another river of the same name, which, flowing in the opposite direction, enters the Paglia at Orvieto, it waters the perfectly level Val di Chiana, which its overflow rendered once the most pestilential district of Italy. Ferdinand III. and his minister, Fossombroni, undertook extensive hydraulic works for improving the bed of the river, which they led through the lakes of Montepulciano and Chiusi, and employed for the artificial irrigation of the whole valley. The district has since become the most fruitful, perhaps, of all Italy—a perfect garden, supporting a pop. of more than 100,000.

CHIA′PA, or CHIAPAS, a state in the s.e. of the Mexican confederation, lying to the s.w. of Yucatan, and extending in lat. between 16° and 18° n., and in long. between 90° 30′ and 94° west. It contains about 19,000 sq.m., and 194,000 inhabitants, chiefly aborigines. Near Palenque, one of the towns of C., are some of the most extensive and magnificent ruins in Central America.

CHIARAMON′TĔ, a t. of Sicily, about 32 m. w.s.w. of Syracuse. It is situated on a hill, and has well-built, regular streets. Wine of good quality is produced in the district. Pop. about 9,000.

CHIA′RI, a t. of Lombardy, 14 m. w. of Brescia, on the railway between that place and Milan. It is an ancient place, many Roman remains being still found here; and at one time it was strongly fortified, but its walls are now ruinous. Silk is the staple manufacture. Pop. 10,000.

CHIAR-OSCU′RO (Ital.), an artistic term, composed of two Italian words, the one of which signifies light, the other darkness or shadow. But C. signifies neither light nor shadow; neither is it adequately described by saying that it is the art of disposing of both the lights and shadows in a picture, so long as either is regarded apart from the other. It is rather *the art of representing light in shadow, and shadow in light*, so that the parts represented in shadow shall still have the clearness and warmth of those in light, and those in light the depth and softness of those in shadow. It is not the making of the one die softly and gradually away into the other, but the preservation of both in combination, as we constantly see it in nature, when the light is not the mere glare of the sun striking on a particular object, nor the shadow the entire absence of the influence of light. That the skillful treatment of C. is a matter of extreme difficulty, is plain enough from the very small number of artists who ever attain to it. Still it is a branch of art without the mastery of which no painting can be successful in any department. It is as indispensable in portrait-painting as in the highest departments of ideal art; and though a just and even a lofty conception of the subject may be distinctly indicated by attention to form alone, it is impossible that its realization can ever be satisfactorily accomplished by any one who has not mastered this most subtle mode of handling colors. The only mode by which a knowledge of C. can be attained, so as to apply it to practice, is by studying it as exhibited by such painters as Titian, Rubens, Rembrandt, and, above all, Correggio.

CHIAVA′RI, a maritime t. of Piedmont, situated on the gulf of Rapallo, at the mouth of the Sturla, 21 m. e.s.e. of Genoa. The houses in general are well built, with open arcades skirting the narrow streets. C. has several fine churches, the principal of which is the *Madonna del' Orto*. Numerous picturesque old towers, one of them of considerable size, are scattered over the town. Lace and silk are manufactured here; and the place is also noted for its light, handsome, cheap furniture, made chiefly of cherry-

wood. The anchovy fishery is important; and in the vicinity are extensive slate-quarries. Pop. 10,457.—The old province of C., of which the above town was the capital, had an area of 155 sq.m., with a pop. of 109,000. Its surface is generally mountainous, but it has valleys of great fertility, yielding grain, grapes, olives, etc. Cattle, sheep, goats, and silk-worms are reared.

CHIAVEN'NA, a t. of Lombardy, beautifully situated in the midst of vineyards, at the junction of the valley of St. Giacomo and Val Bregaglia, 38 m. n.n.w. of Bergamo. It is overlooked by the Rhetian Alps; and its position on the Splügen road secures it considerable traffic. Silk, cotton, and a coarse ware cut out of a soft stone found in the neighborhood, are the chief manufactures. Pop. about 4,000.

CHICA, a red feculent substance, valuable as a dye-stuff, giving an orange-red color to cotton. It is obtained by boiling the leaves of a species of *bignonia* (*b. chica*), a native of the banks of the Cassiquiare and the Orinoco. The Indians use it for painting their bodies. The C. plant is a climber, with abruptly bipinnate leaves, smooth heart-shaped leaflets, and flowers in pendulous axillary panicles. See BIGNONIACEÆ.

CHICA, PITO, POSO, or MAIZE BEER, is a fermented liquor made from maize or Indian corn. It is much used in some parts of South America, and is made in a similar manner to ordinary beer; but the Indians sometimes prepare it by chewing instead of crushing the grain; and that which is so prepared (*chica mascada*, or chewed C.) is most highly esteemed by them. When they wish to make this liquor particularly strong and well flavored, they have also a practice of pouring it into an earthen jar, which contains some pounds of beef; and having made the jar perfectly air-tight, they bury it several feet deep in the ground, where it is left for several years. On the birth of a child, it is their custom thus to bury a jar of C., to be drunk at the same child's marriage. C. has an agreeable flavor, and is very strong and intoxicating. A spirituous liquor is obtained from it by distillation; vinegar is also made from it.

CHICACOLE', a t. of the district of Ganjam, in the presidency of Madras, being in lat. 18° 18′ n., and long. 83° 58′ e., and lying 415 m. to the s.w. of Calcutta, and 435 to the n.e. of Madras. It stands on the left or n. bank of Naglaudee, not far from the bay of Bengal. It is a military station, and contains, besides its garrison (1871), 15,587 native inhabitants. The place has a reputation for its richly worked muslins.

CHICA'GO (pronounced *She-kaw-go*), the principal city of Illinois, and seat of Cook co., is situated on the south-western shore of lake Michigan, at the mouth of the Chicago river, lat. 41° 50′ 20″ n., long. 87° 37′ west. The name is of Indian origin, signifying "wild onion," and is first mentioned by Perrot, a Frenchman, by whom it was visited in 1671. In 1803, a stockade fort was built near the mouth of the river, and named fort Dearborn. When the war with Great Britain broke out in 1812, the government, apprehensive that a post among the Indians so far from the frontiers could not be successfully maintained, ordered the commander to abandon it. The Indians destroyed the fort, which was rebuilt in 1816. C. was first settled in 1831, previous to which time it was a mere frontier-post; in 1832, it contained about a dozen families, besides the officers and soldiers in fort Dearborn. The town was organized by the election of a board of trustees, Aug. 10, 1833. On Sept. 26, of the same year, a treaty was made for all their lands with the Pottawatomies, 7,000 of the tribe being present, after which they were removed w. of the Mississippi river. The first charter of the city was passed by the legislature Mar. 4, 1837. The following table exhibits the rapid increase of Chicago. The estimated number of the pop. in 1835 was 1000, and the exact number, according to the census returns, was, in

1840	4,470	1852	38,733	1865	187,446
1845	12,080	1853	60,652	1870	298,977
1848	20,035	1855	83,509	1872	364,377
1850	28,260	1860	150,000	1875	410,000

C., perhaps the most remarkable city in the world for its rapid growth, is built upon a plain sufficiently elevated to prevent inundaiton. Some years ago, the elevation of the principal streets, also the buildings, were raised from 4 to 10 ft., the object of this gigantic undertaking being to admit a thorough system of sewerage. The Chicago river and its branches separate the city into three divisions, connected by large tunnels. The main stream, flowing directly w., is about 100 yards wide, and forms one of the best harbors on the lakes. Vessels ascend the river and its branches a distance of 4 m. from its mouth, thus affording nearly 18 m. of wharfage. The water for the city is now supplied by a tunnel from lake Michigan, which was opened in 1867, and supplies 57,000,000 gallons daily. There are also about 40 artesian wells. C. possesses a splendid system of public parks, and numerous handsome buildings. More than 30 railways meet here.

The Illinois and Michigan canal, completed in 1848, connects the Chicago and Illinois rivers, thus affording communication between the lakes and Mississippi to the coal-fields of Illinois, and to the vast quarries of so-called Athens marble, regarded as the finest building-material in the country. It is found on the banks of the canal, about 20 m. from C.; and is easily worked when first quarried, like the Caen stone.

The 36 public schools of C.—some capable of holding 1000 children—afford the

means of education, free of charge, to every child in the city. At the head of the system is the high school. Here the sons and daughters of the poorest man may aspire to the highest honors in the classics and modern languages. There are also numerous private schools and seminaries, besides several universities, medical colleges, theological, literary, and scientific institutions, located in Chicago.

Since 1853, pork-packing has been conducted on an enormous scale. In 1872, cattle to the value of $41,000,000 were received, and 16,080 head were packed as beef. The value of hogs received was $33,500,000, and 1,456,650 were packed as pork. Since 1854, C. has been the largest primary grain dépôt in the world. In 1872, 88,426,842 bushels of breadstuffs were received, and 83,364,224 shipped. C. is also the most extensive lumber market in the world. There are 80 newspapers and periodicals.

In Oct., 1871, a terrible fire occurred, which burned 18,000 houses, extending over more than 2,000 acres; 200 persons perished, and nearly 100,000 were rendered homeless. The property burned was estimated at 200,000,000 dollars. This stupendous calamity awakened the sympathy of the civilized world. Great Britain and other countries subscribed money freely for the sufferers. The city was entirely rebuilt in a style of great magnificence within two years.

CHICAGO (*ante*). In 1831, when the first white settlement was made at the mouth of the Chicago river, it seemed an unpromising site for a great city, and for years afterwards there probably was not among its inhabitants one who expected that such a city would grow up on that spot. The river mouth was a sluggish bayou; its banks marshy, muddy flats, suggestive of intermittent and congestive fevers. But harbors on the great lakes were not turned out ready made by nature, but had to be constructed to a greater or less extent by human enterprise and skill, and that of Chicago was no exception to the general rule. There was need of a good harbor at that point, and the location was not unfavorable, if the citizens and the government could be persuaded to spend money enough in the effort. The channel could be dredged, the flats filled, and the waves of the lake beaten back by artificial structures of wood or stone. This work, begun upon a small scale, has been rapidly extended to meet the growing wants of commerce, until C. now has a harbor adequate to the demands of a great city. The shore of the lake at this point presents an even line, extending very nearly due north and south. The river extends back from the lake westerly five eighths of a mile, at which point two branches come in, one from the northward, the other from the southward; thus dividing the city into three parts, known as the n., s., and w. divisions. The s. branch of the river is connected by the Illinois and Michigan canal with the Illinois river at La Salle, thus opening a direct water communication with the Mississippi. In the earlier period of its history, C. suffered much from intermittent and bilious fevers, cholera and other diseases, consequent upon its low, marshy situation; but at length the grade of a large portion of the city was raised from 8 to 10 ft.; block after block of heavy buildings, including some of the largest hotels and stores, being raised to the required level by jack-screws, worked by steam-power. It was one of the most stupendous engineering experiments ever undertaken, but it was successfully accomplished. The Illinois and Michigan canal was completed, 1848. It is 96 m. in length, and at its highest level was originally 12 ft. above the lake; but in 1866–70 the city deepened it at a cost of $3,251,-621. It is now 8½ ft. below the ordinary level of the lake. The river channel was also deepened, so that the lake no longer receives its waters, but itself furnishes a clear stream flowing the other way, giving improved navigation and carrying off the sewerage of the city towards the Illinois river at the rate of a mile an hour. The fruits of this engineering enterprise are seen in the suppression of the foul odors so long endured by the inhabitants, and the consequent improvement in the sanitary condition of the city. The harbor at the mouth of the river is protected by magnificent lines of breakwater, so arranged as to afford space for extensive ship channels and docks. One of the basins thus provided comprises an area of nearly 300 acres, the entrance to which from the lake is 600 ft. wide. The city extends along the lake side about 8 m.; and westward 5 m., embracing an area of about 35 sq. miles. Its grade is 14 ft. above the lake on the eastern side, and 28 ft. at the western extremity. The descent towards the lake from the w. is sufficient for drainage. The city is regularly laid out, the principal avenues running parallel with the lake shore. The streets are generally 80 ft. wide, and some of them are from 3 to 7 m. in length. The scarcity of stone has led to the use of wood, cinders, and gravel for pavements. The streets are lighted with gas, and amply supplied with sewers. The n., s., and w. divisions are connected by numerous bridges across the river and its branches, and by two stone tunnels under the river-bed, of which, one passes under the s. branch, connecting the s. and w. divisions; the other, under the main river, connecting the n. and s. divisions. These tunnels cost nearly $1,000,000. Horse cars traverse the city in every direction. The business portion of the city is mainly in the s. division, and here also are the chief public buildings, hotels, retail stores, etc. The most important public buildings are the U. S. custom-house and post-office, occupying an entire block 342 by 210 ft., and costing upwards of $5,000,000; the chamber of commerce, a spacious and imposing structure, with elaborate interior decorations; the new city hall and county court-house, occupying a whole block and costing $5,000,000; and the exposition building, a vast edifice of iron and glass, 800 ft. long and 200 ft. wide, and surmounted by a dome 60 ft. in diameter and 160 ft. in height. Some

of the 300 churches of the city are fine specimens of various styles of ecclesiastical architecture. C. has 6 public parks, with an aggregate area of nearly 2,000 acres, connected by boulevards 250 ft. wide, extending around the three sides of the city, with a drive on the lake shore. These afford a continuous driveway of more than 30 miles. Lincoln park, in the n. division, contains 230 acres fronting upon the lake. A boulevard on the n., 3½ m. long, connects this with Humboldt park on the w.; while that by another boulevard is in turn connected with Central park, and that again by still another with Douglas park. From the latter a boulevard runs a distance of 9 m. to a park in the s. division. From the s. end of the northern park a broad avenue extends eastward to another fronting upon the lake. The parks of the s. division are just outside of the city limits.

The water communications of C. are of vast extent, embracing the whole chain of northern lakes, with their 3,000 m. of coast-line. Steamboats and sailing vessels of the largest class are employed in commerce with lake Superior, bringing down vast stores of iron and copper ore from that region; while through the Welland canal (around Niagara falls), connecting lake Erie with lake Ontario, vessels loaded at C. pass eastward to Montreal, where connection is made with steamships for Europe. The Erie canal through New York is also a commercial highway for Chicago to the ports of the Atlantic seaboard. The Illinois and Michigan canal, already mentioned, gives the city communication with the Mississippi and its affluents during nine months of every year. But, important as all these water channels are, they are not more so than the network of railroads by which C. is put in rapid communication with a vast region of country extending from the lakes of the north, eastward to New York, Philadelphia, Boston, and Portland; southward to Louisiana and Florida; and westward to the Pacific coast. There is not another such railroad center in the world. From 10,000 to 12,000 m. of railway are in a greater or less degree tributary to this great city, now about 50 years old. The different lines of road converging to the city, as represented on the map, are bewildering alike to the eye and to the imagination. Nearly 400 trains enter and leave daily upon these roads, making an aggregate of nearly 800 arrivals and departures. The accommodations for these roads are, upon the whole, excellent. The Union depot, one of the largest and finest buildings of the kind in the country, is used by two of the principal roads; the Central depot, by two others; and there are three or four more for the use of others. Plans for uniting all the roads at a common center, or for connecting them by a common track, have been proposed.

C. is supplied with an abundance of pure water from lake Michigan by a process which is one of the wonders of modern engineering skill. Two cylindrical brick tunnels, one 6 ft., the other 7 ft. in diameter, starting from the shore at different points, extend a distance of 2 m. under the lake, and meet in an immense crib inclosing a grated cylinder, through which the water descends into them in a stream unfailing as the lake itself. The smallest of these tunnels, extending from the shore of the n. division of the city, was completed in 1866. The water as it is received at the shore end of the tunnel is forced by steam-pumps through a stone tower to a height of 160 ft. into a reservoir, whence it is distributed by pipes to different parts of the city. The top of the water-tower, which is reached by a spiral staircase, affords a fine view of the city and the surrounding country. On the crib, 2 m. out in the lake, stands a light-house, with a dwelling for the keeper. The second and larger tunnel, which supplies the south-western section of the city, was completed in 1874. A tunnel 7 ft. in diameter, passing under the central portion of the city, is to connect the old works with the new, and afford an independent supply of water for extinguishing fires. The tunnels under the lake cost $1,507,622. The water-works altogether, to Jan. 1, 1873, are estimated to have cost more than $5,000,000. Besides the supply from the lake, the city has another resource in some 40 artesian wells, two of which (694 and 911 ft. deep respectively) yield about 1,200,000 gallons per day. The great stock-yards, the west-side parks, and some of the manufacturing establishments, are supplied from these wells.

The educational facilities of C. are extensive, and of a high order of excellence. The public schools, which give instruction to the children of citizens with no distinction of class, are well organized and efficient. The number of these schools in 1883 was 68, occupying 68 buildings, and employing 1,107 teachers—principally women. The school pop. of the city (between 6 and 21 years of age) was 155,166; the number of pupils enrolled, 72,509, of whom 1,377 were in the high school. Of the teachers, 3 were principals of high schools, 37 of grammar, and 20 of primary. Total expenditure for these schools in 1883, $1,327,837, including about $771,065 for teachers' salaries. The school buildings with the land on which they stood were valued at over $6,000,000. The Roman Catholics also have schools, and there are many private academies. The university of Chicago, a Baptist institution, founded by the efforts of Stephen A. Douglas, has connected with it a law school, and the Dearborn astronomical observatory, both well equipped and efficient, and a library of 20,000 volumes. St. Ignatius's college, founded in 1870, also is a flourishing institution. Of the seven medical colleges of the city, one is open to women, two are homeopathic, one is eclectic. Of the four theological seminaries, one is Baptist, one Congregational, one Lutheran, and one Presbyterian. There are also three commercial colleges, and four female colleges or seminaries of high grade. The academy of sciences, established 1857, lost heavily by the great

fire of 1871, but is getting a new museum and library. The public library occupies the old custom-house and post-office, whose walls outlasted the great fire: the number of volumes is estimated at 100,000. According to the latest reports, there were more than 200 newspapers and periodicals published in the city. Of these 16 were daily, 2 semi-weekly, 121 weekly, 13 semi-monthly, 78 monthly, and 4 quarterly; 18 were religious, 16 political, 18 literary, 10 commercial, and 5 juvenile. Some of these papers have a very large circulation, exerting a very wide influence in the north-western states.

The principal religious denominations, according to the number of their churches, rank as follows: Roman Catholic, 45; Methodist, 36; Baptist, 29; Presbyt., 24; Prot. Episcopal, about 17; Congregational, 20; Swedenborgian, 4; Unitarian, 3; Universalist, 3. Benevolent and charitable associations and institutions are numerous. Among them are 7 orphan asylums, 6 dispensaries, 2 asylums for the aged and indigent, 1 home for the friendless, and a multitude of smaller charities. The C. relief and aid society, from its foundation, 1857, has had the management of a large portion of the voluntary charities of the city for the benefit of the poor, infirm, and helpless. The same society disbursed to the sufferers by the great fire of 1871 the sum of nearly $6,000,000, sent for their relief from Europe and every part of the United States. The young men's Christian association was also very active at that time, as it was before and has been since, for the relief of the poor and destitute. The population of C. in 1870 was 298,977; according to the unofficial figures of the census of 1880, as reported by the *Tribune* of that city, it was 503,298. In '84 it was estimated at 650,000.

As a commercial city C. ranks next to New York. It is the center of a vast trade in breadstuffs, live-stock, pork, beef, provisions, lumber, wool, hides, groceries, dry-goods, boots and shoes, hardware, clothing, and tobacco. The statistics now accessible are very inadequate as a means of showing the present extent of the trade and manufactures of the city. Every year shows a startling augmentation of the volume of business of almost every kind in this great western emporium, itself the wonderful growth of but half a century. The aggregate wholesale trade of the city in 1872 was $500,000,000. Total trade, '83, $2,525, 622,994. The total receipts of wheat in 1883 were 20,364,155 bushels. The Chicago City Railway Co. introduced, in 1882, the endless cable power of propelling street cars, and several of its lines are run by this motor with much success. The great yards which are the center of the live-stock trade were opened in 1858. They cover an area of 345 acres, affording a capacity for 21,000 cattle, 75,000 hogs, 25,000 sheep, and 500 horses. They are thoroughly drained, supplied with water from artesian wells, and furnished with every convenience for the reception, care, and transfer of the animals. The total value of live-stock sold in C., in '83, was estimated by the board of trade at $201,252,772. The chief branches of manufactures in C. are iron, flour, high-wines, agricultural implements, pork and meats, boots and shoes, leather, cotton, and watches. It is supposed that at the present time not less than 79,000 people are employed in manufactures of one kind or another, and that nearly one third of the commerce of the city is based upon what they produce. Ship-building also is carried on to some extent. The flour manufacture was temporarily crippled by the great fire, 6 of the 15 mills having been destroyed. The banking business of C. is very large. In 1872, there were 21 national banks, with a capital of over $11,000,000, and more than $23,000,000 of deposits. The annual bank clearing for '80, amounted to $1,725,684,894; '82, $2,366,536,855. The total valuation of real and personal property for taxation in 1872 was $284,197,430; the actual value at the same time was more than $620,000,000. Value of real and personal estate, '83, $133,230,504.

The great fire of Oct., 1871, raged two days and nights, destroying everything upon an area of 2,100 acres, embracing nearly all the business portion of the city, and a very large number of private residences, among which were the most costly in the place. More than 17,000 buildings were destroyed, including the custom-house, court-house, post-office, gas-works, the principal newspaper offices, 32 hotels, 3 railroad depots, 8 school-houses, 10 theaters and halls, 41 churches, 5 grain elevators, and all the national banks but one. The loss on buildings was estimated at $50,000,000; on personal property and merchandise, $140,000,000; total $190,000,000, of which a little over $40,000,000 was recovered on insurance. Many insurance companies were utterly ruined. Not less than $7,000,000 were contributed in this country and in Europe to aid the sufferers. Over 98,000 persons were rendered homeless, while 200 were killed. The recovery of the city from this calamity was rapid, insomuch that after the lapse of three years scarcely a trace of it could be seen, and almost its only evidence was in the immense improvement of the buildings over all the ravaged district.

CHICHEN', a t. of Central America, in the n.e. of the peninsula of Yucatan, which separates the gulf of Mexico from the Caribbean sea, 18 m. to the s.w. of Valladolid. It is one of the principal towns of the state, and is worthy of notice chiefly for the remains of an ancient city, comprising a ruined temple 450 ft. long, a pyramid with a base of 550 ft. square, and a domed edifice ornamented with sculpture.

CHICH'ESTER, a municipal and parliamentary borough and Episcopal city in Sussex, 17½ m. e.n.e. of Portsmouth. It stands on a plain between an arm of the sea and the South Downs, which rise gently on the north. It is well built, and has wide streets. The two main streets cross at right angles, and meet in an elaborately-worked eight-sided

cross. Within the suburbs the city is surrounded by an ancient wall, 1½ m. in circuit, with some semicircular bastions, and now a promenade under the shade of elms. The cathedral, erected in the 12th and 13th centuries, on the site of a wooden one founded 1108, and burned 1114, measures 410 by 227 ft., with a spire 300 ft. high. The aisles are double—a mode of construction to be seen nowhere else in Britain. The cathedral has a rich choir, and portraits of the English sovereigns from the conquest to George I., and of the bishops down to the reformation. The chief trade is in agricultural produce, and live-stock. There are malting, brewing, and tanning establishments. Pop. '81, 9,652. C. returns one member to parliament. The harbor, 2 m. to the s.w. of the city, is a deep inlet of the English channel, of about 8 sq.m.; has several creeks and Thorny isle; and is connected with C. by a canal. C. was the Roman *Regnum*, and has afforded Roman remains—as a mosaic pavement, coins, urns, and an inscription of the dedication of a temple to Neptune and Minerva. C. was taken and partly destroyed, in 491, by the South Saxons. It was soon after rebuilt by Cissa, their king, and called Cissancaster, or Cissa's camp. It was for some time the capital of the kingdom of Sussex. In 1642, the royalists of C. surrendered to the parliamentarians, after a siege of ten days.

CHICKADEE, *Parus atricapillus*, is distinct from the European blackcap. It is about 5½ in. long, and 8 in. in spread of wings. Head and neck, and a patch on the throat, black; other plumage, ash-gray and brown; tail edged with white, and a white bar on the wings. Where it has not been driven away by the English sparrow, it destroys great numbers of canker worms and other caterpillars. It is a very lively, sociable, and useful bird.

CHICKAHOM'INY, a river in Virginia, rising n.w. of Richmond and running e. between the James and the Pamunkey to the w. line of James City co., where it turns abruptly s., and after a course of about 10 m., joins the James. The surrounding country e. of Richmond is level, and in one section there is a large swamp. On and near the C. in the early years of the civil war occurred many of the most important military movements, skirmishes, and battles—here mentioned in the order of time. In 1862, the peninsular campaign on the part of the union army began with the siege of Yorktown, the objective point being Richmond, to reach which it was necessary that the C. should be crossed. McClellan, on the union side, had 118,000 men when the siege was begun, April 5. On the other side, the confederates had 15,000 men in Yorktown, and about 50,000 more scattered over n. Virginia, all under gen. Joseph E. Johnston. The 6th of May was the day for opening fire upon Yorktown, but on the 4th Johnston left the place, taking guns, baggage, etc., and retreated towards Richmond. On the 5th he was assailed by Hooker; and Longstreet, who commanded the rear of the confederates, turned on the defensive just as he had passed Williamsburg. He was met by Hancock's division, and was compelled to abandon his works after a sharp fight; but Longstreet held his position long enough to secure the confederate trains from pursuit. This was the battle of Williamsburg. The union loss was 1856 killed and wounded, and 372 missing. The confederate loss was about the same. On the 27th of May occurred the battle of Hanover Court-House, in which the union loss was 53 killed and 344 wounded and missing. The confederate loss must have been much greater, for McClellan's report says there were about 200 of their dead buried by our troops, and 730 prisoners were sent to the rear. The confederates had now concentrated in and around Richmond, where they had 67,000 men. The next fight on the C. was the battle of the Seven Pines, or of Fair Oaks, which took place on the 31st of May, and resulted in a substantial union victory. The confederate leader, gen. Johnston, was severely wounded, and their losses were very heavy, but, as in most cases, no trustworthy report was made of the numbers. The union army lost 890 killed, 3,627 wounded, and 1222 missing. It is well known that the confederates felt this to be a disastrous defeat, and in common with the people of the northern states, they expected that the next move would be the capture of Richmond; but, for reasons concerning which it is to be said only that they were never explained to the general satisfaction of the people in the northern states, McClellan made no demonstration, and soon the almost defenseless city was powerfully fortified under the direction of gen. Robert E. Lee, who had superseded Johnston in the confederate command. The fourth of the contests of the C. was the battle of Mechanicsville, June 26, and was not important in results. The confederates made several attacks upon two union brigades, but finally abandoned the work after losing about 1500 men; federal loss, 300. A more important action which occurred June 27, is known as the battle of Cold Harbor, or Gaines' Mill; the confederates call it the battle of the Chickahominy. Their loss was about 9,500; the union loss, 4,000 killed and wounded, and 2,000 prisoners. The sixth conflict in the neighborhood of the C. is known as the battle of Savage's Station, June 30, and was not an important affair. The losses were: union, 600; confederate reported at 400. The next was the battle of Frazier's Farm, also June 30, in which there was some sharp fighting, resulting in a union loss of 300 killed and 1500 wounded; and on the other side, 325 killed and 1700 wounded. The battle of Malvern Hill occurred July 1, and involved a union loss of 375 killed and 1800 wounded; and of confederates, 900 killed and 3,500 wounded. All these engagements from June 26 to July 1 cost the federals 1582 killed and 7,709 wounded; and the confederates 3,150 killed and 15,255 wounded. Including prisoners and missing, the totals of loss were

union, 15,429; confederate, 19,405. The object, on the part of the confederates, was to relieve Richmond from the threatened siege and capture; and they succeeded. Near the end of the summer the union armies were withdrawn and combined to form the army of the Potomac. But nearly two years later there occurred one more (the second) battle of Cold Harbor, when Grant had command. The fight took place June 3, 1864, and was substantially a check of the union advance. The federal losses were about 7,000 in all; the losses on the other side were said to be only half as many. It was at this time that Grant sent to Washington the historical dispatch: "I propose to fight it out on this line if it takes all summer."

CHICKAMAU'GA, Battle of, Sept. 19–20, 1863, between the union army of the Cumberland, led by gen. Rosecranz, and the confederate forces led by gens. Bragg and Longstreet. The forces on the union side numbered about 55,000, a quarter of whom were not engaged; the losses were 1644 killed, 9,262 wounded, and 4,948 prisoners; total, 15,854. The confederate reports embrace but two thirds of their army, and show 1394 killed, 8,974 wounded, and 882 missing; total, 11,250. A few days after the battle gen. Rosecranz was relieved, and gen. Grant placed in command. The battle was credited as a victory for the confederates, though no substantial advantage was gained by them.

CHICKAREE, a popular name for the red squirrel, *sciurus Hudsonius*. It abounds in the southern and middle Atlantic states, and is esteemed for the tenderness and flavor of its flesh. It is not so gentle or so easily tamed as the gray squirrel.

CHICKASAW, a co. in n.e. Iowa, on the Wapsipinican river and its tributaries, reached by the McGregor and Missouri river and the Cedar Falls and Minnesota railroads: 576 sq.m.; pop. '80, 14,534. The surface is prairie and woodland, and the soil fertile; agriculture is the chief business. Co. seat, New Hampton.

CHICKASAW, a co. in n.e. Mississippi, on the head waters and tributaries of the Tombigbee river, and touched by the Mobile and Ohio railroad; 990 sq.m.; pop. '80, 17,904—10,215 colored. The county is a part of the territory ceded by the Chickasaw Indians. It has a level surface and fertile soil, producing corn, cotton, etc. Co. seat, Houston.

CHICKASAW BLUFFS, Battle of, Dec. 29, 1862. The siege of Vicksburg being in progress, gen. Sherman (union) was ordered to make an attack in the rear, and for that purpose sent a force up Yazoo river to land above the city and approach it from the north. In this march they came upon a bayou held by a confederate force strongly intrenched. Several attempts were made to force a passage, but without success. The union loss was 192 killed, and 982 wounded. That of the other side was very small.

CHICKASAWS, a nation of Indians occupying a section of the Indian territory, embracing 7,267 sq.m. on the left bank of the Red river. According to their traditions and the evidence of philology, they are closely connected with the Creeks and Choctaws; and they believe that they emigrated with those tribes from the west, crossed the Mississippi, and settled in the district now forming the n.e. part of the state of Mississippi. Here De Soto visited them in 1540. From the first they were hostile to the French, and were frequently at war with them; but with the English they were generally friendly. In 1786, they made a treaty with the United States, and in 1793, they aided the whites in the war against the Creek Indians. In the early years of the present century, part of their territory was ceded for certain annuities, and a portion of the tribe migrated to Arkansas; and in 1832–34, the remainder, about 3,600 in number, surrendered to the federal government the 6,642,000 acres of which they were still the owners, and entered into a treaty with the Choctaws for incorporation into that tribe. This union was afterwards dissolved and by paying the Choctaws $150,000 they secured full possession of their present territory. In the civil war they assisted the confederates, but their rights were restored by the Union government in 1866. The next year they surrendered 7,000,000 acres of land at 4½ cents per acre, the money ($300,000) to go to their late slaves unless, within two years, they adopted them as members of the tribe In Jan., 1873, they concluded to adopt the negroes. The nation has a printed constitution prefaced by a declaration of rights, which asserts that all political power inheres in the people; that all men should be free to worship God according to the dictates of their conscience, and not be compelled to attend, erect, or support any religious ministry against their consent; that there should be freedom of speech; that there should be security from unreasonable searches of property or person; that every person accused of crime should have a speedy trial. All free males 19 years old or over who are Chickasaws by birth or adoption, may vote, unless idiotic, insane, or convicted of infamous crime. There are a senate and house of representatives, the latter of 18 members elected annually by the voters of the counties or districts. A representative must be 21 years old. There are 12 senators elected for two years from the four districts of the state. A senator must be 30 years old, a Chickasaw by birth or adoption, and a resident of his district six months. The governor must have all the qualifications of a senator; he is chosen for two years by popular vote, and has about the same powers and functions as a governor of one of the states. There is a supreme court consisting of a chief and two assistant justices elected to the legislature for four years. There are also circuit and county courts. The

nation has in the custody of the federal government $1,200,000 in bonds on which interest is paid. In 1882, the number of Chickasaws was about 6,000. The reservation contains fine farming lands.

CHI'CKEN-POX, a contagious febrile disease, chiefly of children, and bearing some resemblance to a very mild form of small-pox (q.v.). C. is distinguished by an eruption of vesicles or blebs, which rarely become pustular or yellow, and leave only a very slight incrustation, which falls off in a few days, without any permanent mark or pit, as in small-pox. From its vesicular character, it has been called the *crystal pock.* It has been argued that C. is, in fact, only small-pox modified by previous vaccination; but this opinion, though maintained on good authority, is not generally received by medical men. It is a disease of little or no danger, the fever being often hardly perceptible, and never lasting long.

CHICKEN SNAKE, or Milk Snake, *Ophibolus Eximius,* a harmless individual of the serpent tribe, frequenting houses, stables, and dairies. It is sometimes 5 ft. long, though usually much less; the color is milky white above, sometimes tinged with red, with dusky spots along the vertebral line and smaller spots along the sides, the abdomen silver white or yellowish. It feeds on insects, mice, toads, frogs, and small birds.

CHICKERING, Jonas, 1798–1853; a self-taught piano-maker of Boston, who succeeded in establishing the largest piano-manufactory in the country, at times producing at the rate of 1,500 instruments in a year.

CHICK PEA (*Cicer*), a genus of plants of the natural order *Leguminosæ,* sub-order *Papilionaceæ,* having pinnate leaves; solitary, axillary, stalked flowers; and two-seeded pods, inflated like bladders. The common C. P. (*C. arietinum*) grows wild in the cornfields of the countries around the Mediterranean sea, and in many parts of the east. It is an annual, 1½ to 2 ft. high, of a stiff upright habit, covered with glandular hairs. The seeds abound in farina, and have a slightly bitterish taste. They are about the size of common peas, curiously wrinkled, so that they have been thought to resemble a ram's (*arietis*) head. They are used as food, either boiled or roasted, and are the most common *parched pulse* of the east. They are an important article of French cookery. They have been in general use from the earliest times, and the plant is extensively cultivated in Egypt, Syria, India, the s. of Europe, etc. Its cultivation extends as far north as the southern part of Germany: but in the climate of Britain it is found too tender to be a profitable crop. It is the *Gram* of India, and the *Garvance* of the French, whence the English name *Caravances.* The herbage affords a nutritious food for cattle, and the seeds are one of the occasional substitutes for coffee. In great summer heats, drops exude from this plant, which, on drying, leave crystals of almost pure oxalic acid.

CHICKWEED, *Stellaria media,* one of the most common weeds of gardens and cultivated fields, is a species of stitchwort (q.v.). It is a native of most parts of Europe and of Asia, appearing during the colder months even on the plains of India; an annual, with a weak procumbent stem and ovate leaves, very variable; some of the smaller varieties in dry sunny situations sometimes puzzling young botanists, from having only five or three instead of ten stamens; but always characterized by having the stem curiously marked with a line of hairs, which at each pair of leaves changes from one side to another, and in four changes completes the circuit of the stem. The leaves of C. afford a fine instance of the *sleep of plants,* closing up on the young shoots at night. C. is a good substitute for spinach or greens, although generally little regarded except as a troublesome weed, or gathered only by the poor to make poultices, for which it is very useful, or for feeding cage-birds, which are very fond both of its leaves and seeds. A number of species of a nearly allied genus, *cerastium,* natives of Britain, also bear the name of C., or Mouse-ear C., and the name is occasionally given to other plants, either botanically allied, or of somewhat similar appearance.

CHICLANA, a t. of Andalusia, Spain, about 12 m. s.e. of Cadiz. It is pleasantly situated on a plain between two hills, and its houses being all built of white stone, present a cheerful appearance. It has a splendid hospital. The manufactures are linen, earthenware, and brandy. Its mineral baths are much frequented by the inhabitants of Cadiz. Pop. variously estimated, but probably about 5,000.

CHICOPEE, formerly Cabotsville, and including Chicopee Falls, a manufacturing t. of Massachusetts, U. S., on the left bank of Connecticut river, at the mouth of Chicopee river, 5½ m. n. of Springfield. Chicopee falls supplies water-power to numerous cotton and woolen factories, paper-mills, brass cannon and bell foundries, and the Ames manufacturing company, which makes machinery, swords, bronze cannon, statues, etc. C. has 10 churches and several newspapers. Pop. '80, 11,325.

CHICORY, or Succory (*cichorium*), a genus of plants of the natural order *compositæ,* sub-order *Cichoraceæ,* distinguished by bracts in two unequal rows, the outer always reflexed, the inner latterly becoming so, a nearly naked receptacle, obovate striated achenia, and a pappus of two rows of minute scales. The species are few in number, herbaceous plants, full of milky juice, natives chiefly of the warmer temperate regions of the eastern hemisphere. The common C. or Succory (*C. intybus*) is a perennial plant, found wild in England and most parts of Europe, growing in waysides, borders

of fields, etc. It has a long carrot-like root, externally of a dirty or brownish yellow color, and white within. The stem rises to the height of 2 to 5 ft., branching, the leaves are *runcinate*, resembling those of the dandelion; the flowers sessile, axillary, in pairs, rather large, beautiful, generally blue, more rarely pink or white. C. is pretty extensively cultivated, both in England and on the continent of Europe, for its roots. It is also cultivated for feeding cattle with its leaves. The blanched leaves are sometimes used as a salad, and they are readily procured in winter by placing the roots in a box with a little earth in a cellar.—To this genus belongs also the endive (q.v.).

C. has been used as a substitute for coffee, or to mix with coffee, for at least a century. The roots are pulled up, washed, cut into small pieces, and dried on a kiln, which leaves a shriveled mass not more than one fourth the weight of the original root. It is then roasted in heated iron cylinders, which are kept revolving as in coffee-roasting, during which it loses about 25 to 30 per cent of its weight, and evolves at the same time a disagreeable odor, resembling burned gingerbread. An improvement to the C. during roasting is the addition of 2 lbs. of lard or butter for every cwt. of C., which communicates to it much of the luster and general appearance of coffee. It is then hand-picked, to remove chips of wood, stones, etc., and is reduced to powder, and sold separately as *C. powder* or *C. coffee*, or is added to ordinary ground-coffee, and is sold as a mixture. C. contains a good deal of sugar, but otherwise does not serve to supply the animal economy with any useful ingredient. It gives off a deep brown color to water, when an infusion is made, and hence its main use in coffee. Some people dislike the taste of C., and when largely used, it has a tendency to produce diarrhea; but many people prefer to use coffee mixed with C. owing partly to the taste it communicates, but mainly to the appearance of strength which it gives to the coffee. The C. is liable to adulteration; and roasted beans, pease, carrots, parsnips, mangold-wurzel, acorns, horse-chestnuts, biscuit, oak-bark tan, logwood and mahogany dust, and even the livers of horses and bullocks, are said to be employed in its adulteration.

CHI'COT, a co. in s.e. Arkansas, on the Louisiana border and the Mississippi river, intersected by Crooked and Mason's bayous; 820 sq.m.; pop. '80, 10,117—8555 colored. The surface is level, and in some parts is subjected to inundations; chief productions, corn and cotton. Co. seat, Lake Village.

CHICOUTIMI, the n.e. section of the organized territory of the province of Quebec, Canada; little settled except along the bank of the St. Lawrence and on the Saguenay rivers; 23,753 sq.m.; pop. '71, 17,493, all except about 100 being Roman Catholics, and all except about 800 of French descent. The surface is mostly rugged, and there are immense pine forests of great value. Chief town, Chicoutimi, on the Saguenay, 75 m. from the mouth. C. and Saguenay cos. now form one electoral district.

CHIEF, in heraldry, an ordinary formed by a horizontal line, and occupying the upper part of the escutcheon. Like the other honorable ordinaries, the C. ought properly to take up a third part of the shield; but when the other charges are numerous, the C. is frequently diminished in size.—Any object borne in the upper or chief part of the shield is said to be *in chief*, though the C. be not divided off from the rest of the field, as a separate portion.—*On a chief:* Is when the object is represented on the C., divided off as above described.

CHIEF-JUSTICE, the presiding justice of the supreme court of the United States, and of the courts of highest jurisdiction in most of the several states. The chief-justice of the United States administers the oath on the occasion of the inauguration of the president and vice-president; he presides when an impeached president is tried, and has the nomination of certain judicial officers.

CHIEF-JUSTICE. See JUSTICE COURTS.

CHIEM-SEE, a lake of Upper Bavaria, the largest in the country, lies about 42 m. s.e. of Munich. It is situated at an elevation of more than 1600 fr. above the sea; its length is 12 m., with a breadth of 9, and its greatest depth 500 feet. Its shape is irregular, and its coast much indented. It has three islands; the Achen and Prien flow into it, and its surplus water is discharged by the Alz into the Inn. The C. is famous for its fish; and a small steamer which plies on it, enables travelers to view its fine scenery.

CHIE'RI, a t. of Piedmont, northern Italy, situated on the slope of a hill 9 m. s.e. of Turin. C. is an ancient place. By the later Romans it was called Carea. The church of St. Dominico, built in 1260, has some good paintings; and that of Santa Maria della Scala, built in 1405, is one of the largest Gothic structures in Piedmont. C. is one of oldest manufacturing towns in Europe, its manufacture of fustians and cotton stuffs dating from 1422. Silk, cotton, and linen are still important manufactures. Pop. 9,000.

CHIE'TI (Province). See ABRUZZO, *ante*.

CHIE'TI, an archiepiscopal city of Italy, capital of the province of the same name, is situated on a hill near the Pescara, about 100 m. n. of Naples. It is a well-built and flourishing place, with some imposing public edifices, including a cathedral, lyceum, and theater; and its agreeable situation has made it the residence of numerous wealthy families. The district around is fertile and well cultivated, and in the city, the cloth and silk manufactures afford employment for a considerable number of people. Pop.

15,000. C. is a very old place, being built on the site of the ancient *Teate* of the Romans, many of the remains of which are still visible. In the year 1524, St. Gaetano founded here the order of the Theatines.

CHIFF-CHAFF, *Sylvia hippolais*, a small species of warbler, very widely diffused, being found both in England and in the neighborhood of Calcutta. It is common in the s. of Europe, is in Britain a summer bird of passage, arriving, however, very early in spring, and does not extend northward into Scotland. Its general color is brown; the under parts lighter. It is a very sprightly little bird; but its song consists merely of a frequent repetition of two notes resembling the syllables chiff-chaff. It is also called the lesser pettychaps.

CHIGNEC'TO BAY, the more westerly of the two inlets at the head or n. end of the bay of Fundy, in British North America. It separates Nova Scotia from New Brunswick, is 30 m. long and 8 broad, and has an isthmus of only 14 m. in width between it and Northumberland strait, in the gulf of St. Lawrence.

CHIGOE, or JIG'GER, *Pulex*, or *Sarcopsylla penetrans*, a species of flea (q.v.), rather smaller than the common flea, and with less powerful limbs, found in the West Indies and South America, where it is excessively troublesome, attacking any exposed part of the human body, and affecting a lodgment between the skin and flesh, often under the skin of the foot or the nails of the toes. At first, its presence is indicated only by a slight itching or tingling; but an ulceration is likely soon to be the result, which is not only very painful, but even dangerous, when the female C. is allowed to remain and to deposit her numerous eggs. Before these are deposited, her abdomen becomes distended in an extraordinary manner, as a membranous bag, to the size of a pea. The ulcer speedily contains a great colony of chigoes. The negresses of the West Indies are very expert in extracting the C., which is also removed by washing with tobacco-juice. Rubbing with tobacco-leaves is also employed as a preventative of its attacks.

CHIH-LE, or PECHIH-LE, one of the northern provinces of China, and the most important of the 18, as being the center of government, and containing Pekin, the imperial capital, the residence of the emperor and court. Pop. about 28,000,000; area, 58,949 sq. miles.

CHI- (or TSIN-CHI-) HOANG-TI, or CHING-WANG, Emperor of China from 246 to 210 B.C. He is said to have consolidated eight or more feudatory states in a single kingdom, which covered nearly the territory now occupied. One of his monuments is the great wall, built to keep out barbarians.

CHIHUA'HUA, a city of the Mexican confederation, with 12,000 inhabitants, and a considerable trade between Santa Fé, in New Mexico, and the United States. It is in lat. 28° 40′ n., and long. 105° 33′ w., and has a cathedral, convents, and an aqueduct 3 m. long, besides appropriate buildings, as the capital of the state of its own name. The territory in question, stretching in lat. from 27° to 32° n., and in long. from 104° to 108° 40′ w., is divided from Texas, in the United States, by the Rio Bravo del Norte. It is a table-land, more remarkable for mineral resources than for agricultural productions. It abounds in niter and other salts, and is rich in mines of gold and silver. Pop. 180,000.

CHILBLAINS. See CHAPPED HANDS.

CHILCOTT, GEORGE M. See page 895.

CHILD, Sir JOSIAH, an eminent London merchant, and one of the ablest of the earlier English writers on commerce and political economy, b. in 1630, was the second son of Richard Child, a merchant of London. His principal work is entitled, *Brief Observations concerning Trade and the Interest of Money* (Lond. 1668, 4to); a 2d edition, much enlarged, entitled *A New Discourse of Trade*, was published in 1690. In this work he explains his plans for the relief and employment of the poor, including the substitution of districts or unions for parishes, and the compulsory transportation of paupers to the colonies. He was one of the directors, and for some time chairman of the East India company, and is said to have written several tracts in defense of the trade to the East Indies, which were published anonymously. In 1678 he was created a baronet, and died in 1699.

CHILD, LYDIA MARIA, b. Mass., 1802–80. When 22 years of age she published *Hobomok, an Indian Story*, and a year afterwards *The Rebels, a Tale of the Revolution*, in which she gave a speech by James Otis, and a sermon by Whitfield, both long believed to have been made by the men themselves. For eight years she was the editor of *The Juvenile Miscellany*, a monthly magazine for the young. Among her earlier works are: *The American Frugal Housewife; The Girl's Own Book;* and *The Mother's Book.* She was among the first of the New England anti-slavery writers, beginning with *Appeal in behalf of that Class of Americans called Africans;* and in 1841 she became one of the editors of the *National Anti-Slavery Standard*, in which paper she published her popular *Letters from New York.* Subsequently she published *History of the Condition of Women in all Ages and Nations; Biographies of Good Wives; Life of Isaac T. Hopper; Progress of Religious Ideas; Autumnal Leaves; Looking towards Sunset; The Freedman's Book; A Romance of the Republic*, etc.

CHILDBIRTH. See MIDWIFERY, *ante.*

CHILDERMAS, or Holy Innocents' Day (28th Dec.), is observed by the church of Rome with masses for the children killed by Herod. It was considered unlucky to marry or to begin any work on this day. From Fenn's *Letters* (vol. i. p. 234) we learn that the coronation of king Edward IV. was put off till the Monday, because the preceding Sunday was Childermas day. The learned Gregory says: "It hath been a custom and yet is elsewhere, to whip up the children upon Innocents' day morning, that the memory of Herod's murder might stick the closer, and in a moderate proportion to act over the crueltie again in kinde." C. is also a holiday of the church of England.

CHILDERS, Hugh Culling Eardley. See page 895.

CHILD-KILLING. See Infanticide.

CHILDREN, Legal Capacity of. See Infant, Minor, Pupil, Guardian, Tutor, Curator.

CHILDREN, Societies for the Prevention of Cruelty to. See page 895.

CHILDREN, John George, 1777–1852; an English scientist who traveled in the United States, devoting his attention chiefly to electricity and galvanism. Among his papers, are those discussing the conversion of iron into steel by union with diamond, and a method of extracting silver from the ore without amalgamation. He translated Berzelius on the blow-pipe, and Thenard on chemical analysis. He was for some years secretary of the royal society.

CHILDREN'S AID SOCIETIES, first established in New York city, chiefly by the exertions of Charles L. Brace, about the year 1853. The object of this and its many imitative societies is to care for the poor and neglected children of large cities, to rescue them from want and crime, afford rudimentary education, and provide homes for them, usually among the farmers of the agricultural states. At the last annual meeting of the New York society, the report showed that, during the 32 years of its operation, 74,179 persons had been sent to homes and places of work, and of these 60,000 were children. During the year 1884, no less than 3,459 persons were sent to homes, of whom 1940 were boys, 1287 girls, 86 men, and 146 women. In the lodging-houses, during 30 years, 250,000 different boys and girls have been sheltered and partly fed and instructed. In the industrial schools about 200,000 little girls have been taught. The society brings forward the police statistics on crime to show that "vagrancy and crime among young girls have been greatly diminished during the past 15 or 20 years; while among boys, criminal offenses have not grown with the population, but have been held decidedly in check." Among 204,395 boys who, during the past 30 years, have been in the newsboys' lodging-house, there has been no case of contagious disease, and only one death. The other boys' lodging-houses have been almost equally fortunate. Statistics are given to show that since the establishment of the sick children's mission and summer home 13 years ago, 1000 lives annually have been saved under diarrheal diseases alone, and that the general death-rate has been reduced from 33.76 to 24.93 per 1000. The total expense of the 21 industrial schools in 1884 was $91,074.83, and the average attendance 3,658, making the annual cost for each child $25.17. The average cost for each child in the public schools, not including rents, is $38.41; this expense not including food or clothing. In the lodging-houses, 12,835 boys and girls were fed, sheltered, and taught during the year, at a total expense of $61,875.33. Deducting the receipts, together with the cost of construction ($37,038.48), the net cost was $24,836.85; dividing this by the nightly average attendance, the average cost to the public of each child was $41.76. The average cost per year of each prisoner in the Tombs is $107.75, and the Roman Catholic protectory draws from the city treasury over $100, annually, for each of its inmates. The total number placed out by the society, mainly in western homes, during last year, was 3,459; the total cost for railroad fares, clothing, food, salaries, etc., was $31,070.05: the average cost to the public, accordingly, for each person was $9.00. Yet any one of these children placed in an asylum or poor-house for a year would have cost undoubtedly nearly $140. The number who enjoyed the benefit of the summer home was 4,152; the total expense, deducting cost of construction, $1000.28, and some additions, was $6,669.99; making the average cost for each child $1.60.

CHILDRESS: co. Tex. See page 895.

CHILDS, George Washington, b. Md., 1829; a journalist, for many years and now proprietor of the *Philadelphia Ledger*, one of the earliest and most successful cheap newspapers of the country. He is noted especially for liberal patronage of men of letters, and for generosity towards deserving charities.

CHILD-STEALING. See Abduction.

CHILI, a republic of Spanish origin, in South America, is the most southerly state on the w. side of that continent. It lies wholly between the water-shed of the Andes and the shores of the Pacific, stretching coastwise from Bolivia to Patagonia, in lat. 25° 30′ to 43° 20′ s., and in long. 69° to 74° w., having an extreme length of about 1240 m., and an average breadth of fully 120. Within these limits, however, lies the virtually independent Araucania (q.v.), comprising most of the mainland to the left of the Biobio; while the southern portion is confined chiefly to Chiloe (q.v.) and its archipelago. C. is divided into 16 provinces, of which the aggregate area is officially stated at nearly 130,000 sq.m.; and the pop., in 1875, at 2,068,447. This pop. and area exclude certain regions in Patagonia, over which C. has a merely nominal sway. The capital is Santiago, connected with Valparaiso, the principal port, by a railway and telegraphic wires. The

other towns are on or near the ocean; and, to arrange them according to the relative amounts of their trade, they are Valparaiso, Copiapo and Caldera, Coquimbo, Talcahuano and Concepcion, Huasco, Constitucion, and Valdivia. In 1876, the total imports of C. were valued at £7,058,220, and the exports at £7,554,208; in 1874, at £7,683,600 and £7,308,200 respectively, The foreign commerce of C. is carried on mainly with Great Britain. The staple article of export to this country is copper, the value of which, in 1874, was £2,812,013. The articles of export next in importance are, in order of value, wheat, to the value of £1,180,278; silver ore, to the value, in the same year, of £225,988; and wool, £160,637. The principal articles of British produce imported into C. are cotton and woolen manufactures and iron. In 1874, the value of the total imports of cotton fabrics was £1,923,753; that of woolens, £258,288: and that of iron, wrought and unwrought, £465,596. Among the other imports were hardwares and cutlery, valued at £128,550. The national income amounted in 1878 to £4,088,800, while the expenditure was £4,275,000. In 1879, the public debt was close on £11,000,000, of which above £7,000,000 was held outside the country. The army, as mobilized and increased on account of the war that had then broken out between C. and Peru allied with Bolivia, comprised in 1879 as much as 20,000 men, besides a national guard raised to 30,000 men. The navy, which took an important part in the war, consisted in 1879 of 10 small steamers, and two large and powerful iron-clads.

Roman Catholicism is the prevailing religion, but other beliefs are protected by a law of 1875. In its political constitution, C. appears to be the least democratic republic in the new world. The legislature is composed of two houses. The deputies sit for three years; and the senators are chosen for nine, retiring in thirds at the end of every third year. The voters for a deputy—to say nothing of the still more select voters for a senator—must possess either £100 in real property, or £200 in personal effects, or £20 of income; a pecuniary qualification which is exceptionally doubled for the wealthier localities of Valparaiso and Santiago. In 1848, attempts were made, but in vain, to abolish or modify these restrictions on the suffrage. Under this form of government, C. has maintained a degree of peace and prosperity utterly unknown to the other transatlantic commonwealths of kindred race. In this respect, however, the character of the people has doubtless co-operated with the tendency of the institutions. As contrasted with Spanish America in general, C. contains an unusually large proportion of European blood.

Immediately after the conquest of Peru, C. was seized by Almagro, a companion of Pizarro, subsequently becoming the seat of a captain-generalship, which held sway as far as cape Horn. In 1810, commenced the war of independence, which, at the close of eight years, was decided against Spain by the victory of Maypo.

Geology.—The predominant rocks of C. are crystalline and metamorphic. They form the range of the Andes, except in those districts in which active volcanoes exist, where they are covered with recent volcanic rocks. They occupy also the whole of the level ground between the mountain-range and the shores of the Pacific, with the exception of a narrow stretch of palœzoic fossiliferous strata which run along the coast s. from Santiago for a distance of 300 miles. The coast-line of C. is being continually altered from the elevation of the whole country to an extent of at least 1200 m. along the Pacific shores, produced by volcanic agency. In 1822, the coast was raised 4 ft. at Quintero, and 3 ft. at Valparaiso. Oysters and other mollusks were left dry, and perished, becoming offensive as they decomposed. The change of level was permanent, over an area of 100,000 sq.m., nearly as large as the whole extent of Great Britain and Ireland. A similar extensive elevation was noticed in 1835 by Capt. Fitzroy.

Physically, the continental portion of the republic—for its insular section will, in this respect, be noticed under the head of Chiloe—presents many singularities. Of all the maritime regions on the globe, it is perhaps the most isolated. On every side but the sea—and that sea very remote from the main thoroughfares of commerce—it is beset by difficulties of communication. With the lonely wilderness of Patagonia to the s., and the dreary desert of Atacama on the n., it is bounded on the e. by a mountain chain which, altogether impracticable in winter, can be crossed, even in summer, only by a few passes ranging between 12,450 ft. and 14,370 in elevation. Moreover, this strip between the Andes and the Pacific is broken into plateaus in the interior, and valleys on the coast, by two longitudinal ranges, with numerous lateral spurs; while, throughout the length and breadth, the general level gradually descends, as well to the s. as to the west. In point of mere temperature, so rugged a surface—covering fully 15° of lat., and attaining an altitude of more than 4 m. within about 2° of long.—must present nearly every possible variety. Through the reciprocal action of the Andes (q.v.) and the prevailing winds, the rain-fall graduates itself, with something of mathematical regularity, from the parching skies of the n. to the drenching clouds of the s.—a graduation which, disturbed merely by the melting of the mountain-snows, is, in a great measure, necessarily reflected in the condition and magnitude of the countless water-courses. Hence the rivers to the n. of the Maypo, which enters the Pacific near lat. 34°, are but inconsiderable streams; while, further to the s., the Maule, the Biobio, and the Calacalla are all to some extent navigable.

From the cause last mentioned, different districts vary remarkably in their productions. To the n. of the Coquimbo, about lat. 30°, is chiefly an arid waste, redeemed,

however, from being valueless by its mines; and to the s. of the Biobio, about lat. 37°, timber and pasturage divide the soil between them. The intermediate center alone is fitted for agriculture, yielding, besides maize and hemp, European grains and fruits in abundance. Notwithstanding all the varieties and vicissitudes of climate, the country may claim to be, on the whole, extremely healthy. The manufactures are earthenwares, copper-wares, linens, cordage, soap, leather, and brandy; and, in addition to the wheat and metals already specified, the exports, especially to the south, embrace tallow, hides, jerked beef, and live-stock. C. had, in 1878, 1050 m. of railways. Santiago is connected with Buenos Ayres by a line going over a pass of the Andes 6,000 ft high. There are also common roads; but they are neither numerous nor good. In fact, the want of highways and bridges is a serious obstacle to the progress of trade and cultivation. In the basin of the lower Biobio, coal is plentiful.

*CHILI (*ante*), though less revolutionary than some of its sister republics, has been subjected to several forcible attempts to change the government. The most formidable of these was in 1851. At first the insurgents were victorious, but after 4,000 men had fallen in battle and great damage had been done to business and commerce, the government succeeded in effecting peace by money more than by arms. This was during the presidency of Don Manuel Montt, a man of great ability. He restored peace and prosperity to the country, and it has since been free from internal strife. In 1864, C. sympathized warmly with Peru against Spain, and in the following year its coast was blockaded by a Spanish fleet. March 31, Valparaiso was bombarded, notwithstanding the protest of the foreign ministers and consuls. Thousands of shot and shell were thrown into it, destroying many public and private buildings and involving a loss of 10 millions of dollars, the chief part of which fell on the foreign residents. The remonstrances of the European governments soon compelled a cessation of hostilities and the raising of the blockade. In 1871, a treaty of peace was negotiated through the mediation of the United States government, and signed at Washington. During the past few years C. has advanced greatly both in material and intellectual development. New mines are worked, agricultural schools and societies are exerting a beneficial influence, and great improvements in rivers, harbors, and streets are projected. In 1877, more than 1200 m. of railroad and nearly 5,000 m. of telegraph were in operation, and additional lines of both are in progress. There are 500 efficient government schools, and an equal number established by cities, churches, and private persons. Two normal schools, for male and female teachers are in good condition. The government university at Santiago has a preparatory department connected with its higher course. The conciliar seminary combines collegiate and theological studies. There are also at the capital agricultural, naval, and military schools. The national library, founded by the Jesuits, contains 25,000 volumes, many of which are on theological subjects. In 1843, a dispute arose between C and the Argentine Republic for the possession of Patagonia. Many unsuccessful attempts to settle it were made, and war between the two countries often seemed imminent, but in 1879 a treaty was signed by which the disputed territory was ceded to the Argentine Republic. C. having transferred a portion of disputed territory to Bolivia on condition that the Chilians residing in it should not be taxed, Bolivia did refrain from taxation but confiscated some property owned by a Chilian company. Upon this C. sent troops into Bolivia. Peru offered to mediate between the parties, but the offer having been rejected an alliance followed between Bolivia and Peru, and, in April, 1879, war against C. was declared. Hostile operations have been carried on with great energy. In a naval engagement the Chilians captured the powerful iron-clad steamer Huascar and turned it against its former owners. Peru, with inferior vessels, has since accomplished several daring exploits, and the war goes on with bitterness and varied success. Recently, however, C. has gained decided advantages, capturing Arica, and entering on the siege of Lima. The victories in this war have been not without the accompaniment of indiscriminate pillage and ravage.

CHILI, or CHILLI. See CAPSICUM.

CHIL'IASTS. See MILLENNIUM, *ante*.

CHILI NETTLE. See LOASACEÆ.

CHILI SALTPETER is a commercial name applied to the nitrate of soda. See SODA, NITRATE.

CHILLAN, a t. in the province of Ñuble, Chili; 120 m. n.e. of Concepcion, 35° 56′ s., and 71° 37′ west. The houses have only a ground floor and are built around rectangular courts; the streets are 60 to 70 ft. wide, having open drains in the center. C. is in the center of a large agricultural district of great productiveness, and is an important outlet for grain and cattle by railroad to Tomé. The place is also celebrated for mineral baths. The town was founded by Ruiz de Gamboa in 1594, but has since been several times destroyed and reconstructed. In 1601, it was wasted by the Indians; in 1657, by an earthquake, and in 1797, by the overflow of the river Ñuble. The people then removed to La Horca, where in 1835 their town was again leveled by an earthquake. The next year they began to rebuild on the present site, and now have a prosperous town of about 20,000 population.

CHILLIANWALLA, a village of the Punjab, being 5 m. from the left or e. bank of the Jhelum, the most westerly of the five rivers which give name to the country. It is in lat. 32° 40′ n., and long. 73° 39′ e., being 85 m. to the n.w. of Lahore. C. claims notice as the scene of lord Gough's dearly won victory, over the Sikhs, of Jan., 1849, and also as the site of an obelisk erected to the memory of those who fell in the two Sikh wars.

CHILLICO'THE, a city in Livingston co., Mo., on the Hannibal and St. Joseph, the Chillicothe and Des Moines, and a branch of the St. Louis, Kansas City and Northern railroads, 76 m. e. of St. Joseph; pop. '70, 3,978. It is the largest town in the Grand River valley.

CHILLICO'THÉ, or CHILICOTHE, a city of Ohio, U. S., beautifully situated on the right bank of the Scioto river, 45 m. from its confluence with the Ohio, and the same distance s. of Columbus, on the Cincinnati and Marietta railway and Ohio and Erie canal; has 13 churches, 3 banks, court-house, foundries, steam-engine and agricultural implement factories, etc. Founded in 1796, and former capital of the state. Pop. '70, 8,920.

CHILLINGWORTH, WILLIAM, a famous theologian of the church of England, was b. at Oxford in 1602, and educated at Trinity college in that university, where the arguments of a Jesuit named Fisher induced him to become a Roman Catholic. He withdrew to Douay; but was induced by his godfather, Dr. Laud, then bishop of London, to re-examine the whole controversy between Catholics and Protestants, and, in 1631, he returned to the bosom of the Anglican church. Four years later, he published a work, entitled *The Religion of Protestants a Safe Way to Salvation.* It was exceedingly keen, ingenious, and conclusive in point of argument. C. was perhaps the ablest disputant of his age; and had there not been a certain fickleness and want of solidity about his intellect, and a nervous suspicion that all human reasoning might be vitiated by undiscovered fallacies, he might have produced a really great work. *The Religion of Protestants* acquired a wide popularity. C. was offered church preferment, which he at first refused—having certain scruples in regard to the subscription of the 39 articles—but afterwards accepted. He became chancellor of the church of Sarum, and prebendary of Brixworth, in Northamptonshire. He was a strong royalist, and, on the breaking out of the civil war, accompanied the king's forces. He died Jan., 1644. The best edition of *The Religion of Protestants* appeared in 1742, with sermons, etc., and a life of the author, by Dr. Birch.

CHILLON, a celebrated castle and fortress of Switzerland, in the canton of Vaud, 6 m. s.e. of Vevay. It is situated at the e. end of the lake of Geneva, on an isolated rock, almost entirely surrounded by deep water, and is connected with the shore by a wooden bridge. The castle is said to have been built in 1238, by Amadeus IV. of Savoy, and it long served as a state prison. It is famous as the prison of Bonnivard, the prior of St. Victor, who having, by his efforts to free the Genevese, rendered himself obnoxious to the duke of Savoy, was carried off by emissaries of that potentate, and confined here for six years, at the end of which time the castle had to surrender to the Bernese and Genevese, when Bonnivard was liberated. C. has been immortalized by Byron's *Prisoner of Chillon.* The castle is now used as a magazine for military stores.

CHILMA'REE, or CHALAMARI, a t. in British India, in the presidency of Bengal, 35 m. s.e. of Rungpur, on the Brahmaputra. It is remarkable chiefly as the seat of a great religious and commercial festival which brings together sometimes 100,000 people.

CHILOE', the insular province of Chili (q.v.), is an archipelago on the w. side of South America, which takes its name from its principal island. It is separated from the rest of the republic, or rather from Patagonia, by the gulf of Ancud, extending in s. lat. from 41° 40′ to 43° 20′, and in w. long. from 73° to 74°. The province—which, in 1875, numbered 64,536 inhabitants—contains, in addition to C. proper, about 60 islets, of which about 30 are uninhabited. In the archipelago are two towns, both of them seaports of C. proper—Castro, the ancient capital, on the e. coast; and San Carlos, the modern seat of government, towards the n.w. extremity. The atmosphere, like that of the mainland opposite, is excessively moist; the westerly winds, more particularly in winter, bringing almost constant rains. The climate, however, is on the whole healthy. This fact is the more remarkable, inasmuch as C. proper is one natural forest, measuring 100 m. by 40, with a partially cleared and cultivated margin on the sea. The chief products are wheat, barley, potatoes, apples, and strawberries; and cattle, sheep, and pigs are reared in considerable numbers. Agriculture, however, is in a very primitive state ; and the staple food of many consists of mussels and oysters. The population, equally indolent and poor, differs from that of the rest of Chili in the great preponderance of aboriginal blood. Schools are numerous; but, from the ignorance of the teachers, education has not made satisfactory progress. The principal manufacture is a coarse woolen cloth, dyed blue. This archipelago was discovered by the Spaniards as late as 1558; and as it was the last integral portion of Spanish America to be colonized, so also was it the last to throw off the mother-country's yoke.

CHILOGNA'THA AND CHILO'PODA. See MYRIAPODA.

CHILON, or CHILO, one of the seven sages of Greece, by birth a Lacedæmonian. He appears to have lived about the 6th c. B.C. It is said that he died from joy, on

learning that his son had gained a prize in the Olympian games. Many of his apophthegms have been handed down to us. According to Chilon, the greatest virtue of man was prudence, or well-grounded judgment as to future events.

CHIL'TERN HILLS, the s. part of the low chalk range which runs n.e., about 70 m., from the n. bend of the Thames, in Oxfordshire, through Bucks and the borders of Herts and Beds, and ends in Norfolk and Suffolk. In Oxford, Herts, and Beds, the C. H. are 15 to 20 m. broad, and the highest points are Wendover, 905 ft.; and Whitehouse, 893.

CHILTERN HUNDREDS. In former times, the beech-forests which covered the Chiltern Hills, in Buckinghamshire, were infested with robbers, and in order to restrain them, and protect the peaceable inhabitants of the neighborhood from their inroads, it was usual for the crown to appoint an officer, who was called the steward of the Chiltern Hundreds. The office, which has long ceased to serve its primary, now serves a secondary purpose. A member of the house of commons cannot resign his seat unless disqualified either by the acceptance of a place of honor and profit under the crown, or by some other cause. Now, the stewardship of the C. H. is held to be such a place, and it is consequently applied for by, and granted, in the general case as a matter of course, to any member who wishes to resign. As soon as it is obtained, it is again resigned, and is thus generally vacant when required for the purpose in question. When the C. H. are not vacant, however, the same purpose is served by the stewardship of the manors of East Hendred, Northshead, and Hempholme. As to the offices which are held to vacate seats, see ELECTION. "The practice of granting the C. H. for the purpose above described began only about the year 1750, and its strict legality has been doubted, on the ground that the stewardship is not an office of the kind requisite to vacate a seat. The gift of the C. H. lies with the chancellor of the exchequer, and there is at least one instance of its being refused. In 1842, after very awkward disclosures had been made before a committee of the house of commons, as to corrupt compromises, which had been entered into for the purpose of avoiding investigation into gross bribery in the election to certain boroughs, of which Reading was one, the member for Reading applied for the stewardship of the C. H., and was refused—the chancellor of the exchequer being of opinion that, by granting it, he would in some sort have made himself a party to transactions which he did not approve, and of which the house of commons had implied its condemnation."—*Standard Library of Political Knowledge*, p. 500.

CHILTON : co. Al. See page 896.

CHIMÆ'RA, a genus of cartilaginous fishes, ranked by Cuvier with the sturgeons (*Sturionidæ*), but now generally regarded as the type of a distinct family, of which only two or three species are known. The gills have a single wide opening, as in the sturgeons; but the gill lid or *operculum* is merely rudimental, and concealed in the skin, whilst there is an approach to sharks in the structure of the gills. The only known species of C. is *C. monstrosa,* occasionally found in the British seas, and more common in more northern latitudes. It is sometimes called the *king of the herrings.* It pursues the shoals of herrings, and is consequently sometimes taken in herring-nets. It is seldom more than 3 ft. long. Its general color is silvery white, the upper parts mottled with brown. It produces very large leathery eggs.

CHIMÆRA, a mythical monster, described by Homer as having a lion's head, a goat's body, and the tail of a dragon. The rationalistic account of C. is, that it represented a mountain in Lycia whose top was the resort of lions, its middle of goats, and the marshy ground at the bottom of which abounded with serpents. In the same manner, Bellerophon's (q.v.) victory over the C. is explained by saying, that he first made his residence on this mountain. The myth seems, at all events, to have belonged to Asia Minor, as gigantic carvings of the C. on rocks are there found. It is usually represented as a lion, out of the back of which grows the head and neck of a goat.—C. is used figuratively to denote any monstrous or impossible conception, the unnatural birth of the fancy. It is frequently depicted on shields, as a heraldic charge.

CHIMAPH'ILA. See WINTER-GREEN.

CHIMA'RA, or CHIMARI. See CERAUNIAN MOUNTAINS.

CHIMAY, JEANNE MARIE IGNACE THÉRÈSE, Princess of: 1775–1835; daughter of count Cabarrus, minister of finance in Spain; early married to M. de Fontenay, soon divorced, and next married to Tallien, the French revolutionist, whom she induced to engage in a plot for the overthrow of Robespierre, and thus made herself the chief promoter of the revolution of July, 1794. Her beauty and her free manners with her consequent social triumphs gave her husband offense, and he left her, going with Napoleon to Egypt. A mutual divorce followed on his return, and Jeanne then married count Caraman, with whom she lived peaceably. While ranking first among the beauties of the time, she was never admitted to court circles. She is represented as amiable, witty, kind, and always ready to serve even her enemies.

CHIMBORA'ÇO, a conical peak of the Andes, in Quito, 21,510 ft. above the sea, but only about 12,000 above the level of its own table-land. It is capped with perpetual snow, and was long regarded as the loftiest mountain in the world. Latterly, how-

ever, it has been ascertained to be overtopped by some peaks, not merely of the Himaayas, but even of the central division of its own chain. Its lat. and long. are 1° 20′ s., and 79° west. The summit was for the first time reached by Stübel in 1872. Humboldt ascended within 2,138 ft. of it, and Boussingault and Hall within 1729.

CHIME'RE, "the upper robe worn by a bishop, to which the lawn-sleeves are now generally attached." Since the time of queen Elizabeth, it has been of black satin, but previously it was of a scarlet color, like that worn by the bishops when assembled in convocation, and when the sovereign attends parliament.

CHIMES, music performed on bells in a church tower, either by the hands of a performer or by mechanism. The most perfect C. are to be found in Holland and Belgium.

CHIMES (*ante*). This class of music is believed to have originated in some of the German monasteries, and the first instrument for the production of C. to have been made in 1487 at Alost, in the Netherlands. Among the celebrated chimes of Europe are those of Copenhagen, Ghent, and Amsterdam. A number of bells is required for a proper execution of this music. The *carillons à clavier* are played like a piano-forte; the keys are handles connected with the bells by rods or cords, and the *carillonneur* employs his hands and feet to play an air. The pedals communicate with the larger bells for the bass. The keys on which the treble notes depend are struck with the hand, which is protected by a leather covering. It is stated that Potthoff, a blind organist of Amsterdam, was able to perform fugues on this instrument. The invention of carillon machinery is of modern origin; one person now is able by simply turning a barrel similar to that of a music box to chime eight bells with little difficulty. C. have been largely introduced into our American churches. In New York there are four churches that have large chimes, St. Thomas, Grace, Trinity, and St. Ann's. The C. of Christ church in Philadelphia, Christ church in Boston, and Trinity church in New York, are probably the oldest in this country. Little is known of the Trinity church bells, except that five of them were cast in London before the year 1845. The ten bells have an aggregate weight of about 15,000 lbs.; the largest weighs 3,081 lbs., the smallest, 700 lbs.; they are hung in a frame-work of wood, and the machinery is somewhat primitive. St. Thomas church has ten bells which were cast at Meneely's in w. Troy, and put up in 1874; they are very fine in tone and tune. Grace church has ten bells with an aggregate weight of 10,300 lbs., the largest, called the Rector's bell, weighs 2,835 lbs.; they are played on by means of a *carillon à clavier*, like those in Holland. The C. of old Christ church in Philadelphia are of historic interest. These bells were sent from England as a present from queen Anne; they were taken down during the revolution, and sunk in the Delaware river, as it was feared the British might capture them. At the close of the war they were hung in the old belfry; and may now be heard on every holiday through the year. Christ church in Boston also has an ancient and notable chime. Full and partial chimes, the latter called peals, can now be heard in all parts of the country. There are three sets of chimes in Troy, N. Y. The church of the Good Shepherd, in Hartford; St. James church in Birmingham, Conn.; old St. John's in Savannah, Ga.; churches of different denominations in Indianapolis, Petersburg, Va.; Cleveland, O.; Concord, N. H.; Rochester, N. Y.; and many others, produce chime music. Worth mentioning are those of St. Ann's, in Brooklyn; St. John's, in Newark; Grace church, and St. Patrick's, in Buffalo; the cathedral of the Immaculate Conception, in Albany; St. Paul's, in Reading, Pa.; Pilgrim church, in St. Louis; in the bell-tower of Cornell university, at Ithaca, N. Y.; and in the college chapel at Amherst, Mass. The half C. and peals in the United States are very numerous. (See BELL, *ante.*)

CHIMNEY (Fr. *cheminée*, Lat. *caminus*). There seems reason to believe that the C., in its present sense of a funnel from the hearth or fire-place to the roof of the house, is a modern invention. In Greek houses it is supposed that there were no chimneys, and that the smoke escaped through a hole in the roof. What the arrangement was in houses in which there was an upper story, is not known; perhaps the smoke was conveyed by a short funnel through the side-wall of the house, which seems to have been the first form of C. invented in the middle ages. The Roman *caminus*, again, was not a C., but a sort of stove; and it has been a subject of much dispute, whether the Romans had any artificial mode of carrying off the smoke, or whether it was allowed to escape through the doors, windows, and openings in the roof. As the climate and the habits of the people both led to the houses of the ancients being very much more open than ours are, it is probable that the occasional fires which they had of wood or charcoal may have given them no great inconvenience. It is known, besides, that the rooms in Roman houses were frequently heated by means of hot air, which was brought in pipes from a furnace below. In England, there is no evidence of the use of chimney-shafts earlier than the 12th century. In Rochester castle (*circa* 1130), complete fire-places appear; but the flues go only a few feet up in the thickness of the wall, and are then turned out through the wall to the back of the fire-place, the openings being small oblong holes. The earliest chimney-shafts are circular, and of considerable height. Afterwards, chimneys are found in a great variety of forms. Previous to the 16th c., many of them are short, and terminated by a spire or pinnacle, having apertures of various shapes.

These apertures are sometimes in the pinnacle, sometimes under it, the smoke escaping as from some modern manufacturing chimney-stalks which are built in the form of an Egyptian obelisk. Clustered chimney-stalks do not appear until late in the 15th c., when they seem to have been introduced simultaneously with the use of brick for this purpose. Each of the earlier clustered chimneys consists of two flues which adhere to each other, and are not set separate, as afterwards was the practice. Long after they were invented, and in use for other rooms, our ancestors did not generally introduce them into their halls, which, till the end of the 15th, or beginning of the 16th c., continued as formerly to be heated by a fire on an open hearth in the center of the hall, the smoke escaping through an opening in the roof known by the name of *lòuvre*. In many of the older halls in which chimneys exist, they have evidently been inserted about this period.

The action of a C. depends upon the simple principle, that a column of heated air is lighter than a cooler column of equal height; when therefore a flue full of heated air communicates freely by the lower part with the cooler air around it, the greater weight of the latter pushes the warm air upwards, and thus an ascending current is produced. Other conditions being equal, the draught of a C. will thus be proportional to its perpendicular height, and the difference between the temperature within and without it. The straighter and more perpendicular the C., the stronger will be the draught, because the friction of the ascending current will be less, and the cooling effect of a long or tortuous course will be saved. The maximum efficiency of a given C. is attained when all the air that passes up it enters by the bottom of the fire. In this case, its temperature is raised to the uttermost by passing through the whole of the fire, and the fire is at the same time urged to vivid combustion by the blast thus obtained. A powerful furnace may be constructed by connecting a suitable fire-place, capable of being closed all round excepting at the bottom, with a tall C.; and the amount of draught may be regulated by increasing or diminishing the aperture through which the air is admitted to the bottom of the fire-place, or by an adjustable opening above the fire-place, which will diminish the effective draught as its size is increased, or by a combination of both of these contrivances.

When the fireplace can be inclosed thus, there is little liability to descending currents or "smoky chimneys," as they are called, even when the C. is very short, or has a tortuous course. It is chiefly with open fireplaces that this defect occurs, and the means of prevention and cure is a subject of some interest and importance. As with most other evils, the prevention is far easier than the cure; for by properly constructing the C. in accordance with the principles above stated—by placing the opening of the C. as nearly over the fire, and contracting the open space above the fire, as much as possible—downward smoking may in most cases be easily prevented. When a C. is in the neighborhood of a wall or building nearly as high as itself, or—what is still worse—higher, it is apt to smoke on account of the eddies and other complex currents in the air, caused by the interference which such an obstacle presents to the regular movement of the wind. In towns, such tortuous movements of the atmosphere are very common, and the contrivance for preventing the wind from blowing down the chimneys are very numerous, and often grotesque. Revolving cowls of various forms, but alike in having a nearly horizontal outlet, which is so turned by the wind that the mouth shall always point in the direction opposite to that whence the wind is blowing, are the most common, and usually the most effectual. They are generally constructed of sheet-zinc, with an arrow, a flattened pigeon, or other device, as a vane, to determine the rotation of the cowl. The curing of smoky chimneys, in conjunction with the economizing of fuel, was one of the favorite subjects of investigation of that very practical philosopher, count Rumford. He says: "Those who will take the trouble to consider the nature and properties of elastic fluids—of air, smoke, and vapor—and to examine the laws of their motions, and the necessary consequences of their being rarefied by heat, will perceive that it would be as much a miracle if smoke should not rise in a chimney—all hindrances to its ascent being removed—as that water should refuse to run in a siphon, or to descend a river. The whole mystery, therefore, of curing smoky chimneys is comprised in this simple direction: find out and remove those local hindrances which forcibly prevent the smoke from following its natural tendency to go up the chimney; or rather, to speak more accurately, which prevent its being forced up by the pressure of the heavier air of the room."* He then goes on to speak of above 500 smoking chimneys that he has had under his hands, and which were supposed incurable, and states that he was never obliged, "except in one single instance, to have recourse to any other method of cure than merely reducing the fireplace and throat of the chimney, or that part of it which lies immediately above the fireplace, to a proper form and just dimensions."

In this reduction, the section of the fireplace is changed in form and size, whence it is better adapted for radiation into the room than the former square opening; the fire being brought further forward, has also more heating effect; the space of the fireplace being smaller, the air within it will, with a given sized fire, become hotter, and therefore

* *Essays: Political, Economical, and Philosophical*, by Benjamin count Rumford, vol. i. p. 299.

have more ascending power; while in the contracted throat widening downwards, and having its sides strongly heated, there is a rapid rush of heated air, which carries the smoke upwards, and resists the passage of temporary down-draughts. Most modern chimneys and fireplaces are now constructed in accordance with count Rumford's suggestions. See GRATE.

One frequent cause of smoky chimneys is the want of sufficient inlet for air to the room. Sand-bags placed under doors, and other devices for preventing ventilation, may cause a well-constructed C. to smoke. Openings must exist somewhere, of sufficient capacity to supply the air which is to ascend the chimney. If the air enters the room on the same side as the fireplace, and sudden gusts of air pass across the front of the fireplace, a temporary descending current is likely to be produced. The openings are best opposite the fire. For the methods of arranging and regulating such openings for the admission of air, see VENTILATION.

Tall factory-chimneys, usually built of brick, are very costly structures, many of them rivaling in height our loftiest cathedral spires. Their construction has been considerably economized by building from the inside, and thus saving the expensive scaffolding. Their walls are built very thick at the base, and gradually thinner upwards: recesses are left at regular intervals in the inside, and stout wooden or iron bars rest upon these to form a sort of temporary ladder for the workmen to ascend; the materials are hoisted by ropes and pulleys.

Sheet-iron chimneys are largely used in Belgium. They are much cheaper but less durable than brick, and are objectionable on account of their rapid cooling by the action of the external air.

CHIMPAN'ZEE, *Troglodytes niger,* a species of ape; one of those which in form and structure exhibit the greatest resemblance to man. It is a native of the warmest parts of Africa; to which also the gorilla (q.v.), a larger species of the same genus, belongs. The C. is sometimes called the black orang; but differs from the orang (q.v.) (*pithecus*) of Asia in the proportionally shorter arms, which, however, are much longer than those of man; in the possession of an additional dorsal vertebra, and an additional or thirteenth pair of ribs; and in other particulars, in some of which it more nearly resembles, and in others more widely differs, from the human species. In both, the difference from man is very wide in the general adaptation of the structure for movement on all-fours and for climbing and moving about among branches, rather than for erect walking, although the C. is able to move in an erect posture more easily than any other ape, usually, however, when so doing, holding its thighs with its hands; and still more in the form of the skull, and consequent aspect of the countenance, the facial angle being as low as 35° in the C. when it is measured without regard to the high bony ridges which project above the eyes; the jaws excessively projecting, and the outline of the face rather concave. There is also an important difference from the human species in the dentition; although the number of teeth of each kind is the same, the canine teeth of the apes are elongated, so as to pass each other, and corresponding intervals are provided for them in the opposite jaw. An interesting point of difference of the anatomy of the C. and orang from that of man, is in the muscle which in man terminates in a single tendon, and concentrates its action on the great toe, terminating in the apes in three tendons, none of which is connected with the great toe or hinder thumb, but which flex the three middle toes; part of the adaptation of the foot for clasping as a hand. The great toe both of the C. and orang is shorter than the other toes, and opposed to them as a thumb.

The C. does not seem to attain a height of quite 4 ft. when in an erect posture. Its skin is thinly covered with long black hair in front; the hair is thicker on the head, back, and limbs. The ears are remarkably prominent, thin, and naked, not unlike human ears in shape. The nose appears as little more than a mere wrinkle of the skin. The thumb of the hand is small and weak, that of the foot comparatively large and powerful. In a wild state, the animal appears to be gregarious, but its habits are not well known. Truth and fable have been so mixed up in the accounts of it that new information must be obtained from reliable sources, before even things not in themselves very improbable can be believed. In a state of confinement, it exhibits, at least when young, considerable gentleness and docility, and readily learns to imitate human actions, in eating with a spoon, drinking out of a glass, and the like; but its intelligence does not appear to be superior to that of many other monkeys, or indeed of many kinds of brutes. Its natural food consists chiefly of fruit and other vegetable substances; in confinement, it exhibits a great fondness for sweetmeats and for wine. The C. is impatient of cold, and the climate of Britain soon proves fatal to it.

CHIMSEYANS, Indians of the n.w. coast of North America, between 53° and 55° n., including several small tribes. They are noted, like the Indians of Alaska, for disfiguring themselves by inserting a large piece of wood or ivory in the under lip. Their language is said to be sonorous and comprehensive.

CHINA. See CHINESE EMPIRE.

CHINA, or China-ware. See Porcelain.

CHINA BARK, a name of cinchona (q.v.) bark, often to be met in books, and in common use on the continent. It is derived, not from the empire of China, but from *kina* or *quina*, the Peruvian name of cinchona.

CHINA CLAY, or Ka'olin. See Clay.

CHINA GRASS, or Chinese Grass, the popular name of a fiber used in China for the manufacture of a beautiful fabric known as *grass-cloth*. The name appears to have originated in the belief that the fiber was that of a grass; but this is not the case, it being chiefly obtained from *bœhmeria* (q.v.) *nivea*, a plant allied to the nettle. Besides this and other species of the natural order *urticaceæ*, other plants, as species of *corchorus* (q.v.) and *sida* (q.v.) are believed to yield fibers employed in the same manufacture. The fibers are said not to be spun after the European manner, but joined into long threads by twisting their ends together. Grass-cloth is now brought in considerable quantity to Europe, especially in the form of pocket-handkerchiefs. It has a fine glossy appearance and a peculiar transparency.

CHINANDE'GA, a t. of Central America, Nicaragua, stands in a fertile plain at the foot of some mountains, about 18 m. n.w. of Leon, and about 10 m. from the Pacific coast. The houses are straggling, of one story, built of adobes, and many of them are inclosed by gardens and plantations. Maize, sugar, cotton, hides, and poultry are produced in the vicinity. Pop. about 10,000.—Old Chinandega, which is contiguous, has a pop. of about 4,000.

CHINA ROOT, the root, or rather the *rhizome* (root-stock) of *smilax China*, a climbing shrubby plant, closely allied to sarsaparilla, and belonging to the same genus; a native of China, Cochin-China, and Japan. See Sarsaparilla and Smilaceæ. The stem is round and prickly, the leaves thin and roundish oblong; the rhizome tuberous and large; sub-astringent and diaphoretic. It is occasionally used in medicine, and is imported in a dry state into Europe; but it is also employed in the e. as an article of food. It abounds in starch.

CHINA WAX, produced by an insect which lies on the ash trees of China. It is scraped from the limbs, melted and strained, when it resembles bees' wax.

CHINCHA ISLANDS, three small islands in the Pacific, 13° 38′ s. and 76° 28′ w., 12 m. from the coast of Peru, and 106 m. from Callao. The largest, known as north island, is only about 170 acres in surface. The importance of the islands is owing to their immense deposits of guano. They are of granitic formation, rising from the sea in precipitous cliffs, worn into countless caves and hollows, which furnish convenient resting places for sea-fowl. Their highest point, now 113 ft., was once nearly 90 ft. higher, the whole deposit being of guano. The name of the islands and of the town and valley of Chincha in the mainland is derived from an ancient Indian race, which has left some interesting relics of its sojourn. A stone idol and two water-pots of grotesque form were discovered under 62 ft. of guano; and a number of wooden idols, two regal emblems, and a curious stone slab have been found. In 1846, the amount of guano in these islands was estimated to be 18,250,000 tons, and in 1852 there still remained 12,360,000 tons. The supply is now nearly exhausted. Between 1853 and 1872, 8,000,000 were taken from the n. and middle islands. In 1868, there was a population of 6,000; in 1874, only 105 remained.

CHINCHAYCO'CHA, a lake in Peru, 10° 42′ s. and 75° 40′ w., 10 m. s.s.e. of Pasco, and 13,000 ft. above sea-level. It is 35 m. long by about 7 wide.

CHINCH BUG, *Blissus leucopterus*, an insect which has sometimes done immense damage to wheat and other crops in the western United States. The female lays her eggs on the ground, and there are often two swarms of bugs in a single year, one in June and one in the autumn. The chinch bug is from a seventh to a fifth of an inch in length; the wing-covers are black, with three or four white dashes, sometimes wanting; the body is usually black, though the unwinged young are at first red, with a white band on the back.

CHINCHEW, or Chinchu, an ancient and famous port of China, in the province of Fuh-keen, 27° 57′ n. and 118° 35′ east. Though occasionally visited by missionaries and others, Chinchu is not one of the treaty ports. The chief exports are tea, sugar, china-ware, tobacco, and nankeens. The English Presbyterians have had a chapel in the city since 1862. In the middle ages this city was the great port for western trade with China, and was known to Europeans as Zayton.

CHINCHILLA, *Chinchilla*, *Eriomys*, or *Callomys*, a genus of South American quadrupeds, of the order *rodentia;* the type of a family, *chinchillidæ*, allied to cavies (*cavidæ*), but differing from them in possessing clavicles. The general aspect is somewhat rabbit-like. There are several genera of *chinchillidæ*, distinguished in part by the number of toes; the true chinchillas having four, with the rudiment of a fifth on the fore-feet, and four on the hind-feet; whilst in the genus *lagidium* or *lagotis* there are four on each foot;

and in *lagostomus*, four on the fore-feet and three on the hind-feet. All the species of this family are gregarious; feed much on roots, for which their strong and sharp incisors are particularly adapted; and live either in holes, which they select for themselves in rocky districts, or in burrows, which they excavate. They are valued for their fur, particularly the CHINCHILLA of the Andes (*C. lanigera*), of which the fur constitutes an important article of commerce. Their numbers are said to be sensibly decreasing in consequence of the demand for the fur. The ancient Peruvians were accustomed to employ the wool of the C. for the manufacture of fine fabrics. Molina suggests that it might easily and profitably be kept in a domesticated state.

CHINCHILLA, a t. of Spain, in the province of Albacete, 10 m. s.e. of the city of that name. It is situated on an abrupt rocky hill, crowned by a castle, and is surrounded by walls. The town is in general well built, with good streets, and a fine parish church, containing some excellent works of art. It has manufactures of cloth, linen, leather, earthenware, and glass, and a trade in the agricultural produce of the district. Pop. 7,500.

CHINCHON′, a t. of Spain, in the province of Madrid, 25 m. s.s.e. of the city of that name. It is pleasantly situated on a hill near the Tagus, and is well built, with wide, regular, and clean streets. Agriculture forms the chief occupation of the inhabitants, but leather, linen, and earthenware are manufactured to a small extent. Pop. 5,400.

CHINDWA′RA, a t. in the central provinces of India, lat. 22° 3′ n., and long. 78° 58 east. It occupies a plateau amid the Deoghur mountains, standing 2,100 ft. above the level of the sea. Its climate is consequently one of the most agreeable and salubrious in India, attracting many visitors in search of health or recreation. Pop. '72, 8,626.

CHINE, LA, a village of the dominion of Canada on the s. side of the island of Montreal, and about 9 m. to the w. of the city of that name. Both the city and the village stand on the left bank of the St. Lawrence, or rather, of a branch of the Ottawa; for here, and at least 10 or 12 m. further down, these united rivers keep their waters unmingled. As the intermediate portion of the stream forms the rapids of St. Louis' the consequent interruption of the navigation naturally rendered La C. a turning-point between the maritime and the inland communications. Gradually, however, its importance in this respect has been diminished, if not extinguished, by works between it and Montreal—a canal, a railway, and even improvements in the rapids themselves. The pop. in '81, was 2,406. The name is now written, Lachine.

***CHINESE EMPIRE,** a vast territory in eastern Asia, comprehending five great divisions, viz.: 1. Mantchuria (q.v.); 2. Mongolia (q.v.); 3. Turkestan (q.v.); 4. Thibet (q.v.); 5. China proper or the eighteen provinces (*Shih-pă-sang*), including the two large islands of Formosa and Hainan—the former being reckoned in the province of Fuh-keen, and the latter as a department of Kwang-tung.

China Proper occupies the eastern slope of the table-lands of central Asia. In form it approaches to a square, and covers a surface eighteen times as large as Great Britain. It is inhabited by more than 360 millions of the human race, living under the same government, ruled by the same laws, speaking the same language, studying the same literature, possessing a greater homogeneity, a history extending over a longer period, and a more enduring national existence than any other people, whether of ancient or modern times; indeed, when we consider its high antiquity, its peculiar civilization, its elaborate administrative machinery, its wondrous language, its philosophy and classic literature, its manufacturing industry and natural productions, giving rise to such a gigantic commerce with our own land, China is perhaps the most remarkable country in the world, and is worth a closer and more serious study than has yet been generally accorded to it. China proper is included between 18° and 40° n. lat. (which takes in the island of Hainan), and 98° to 124° e. longitude. Its coast-line exceeds 2,500 m. and the land-frontier 4,400 miles. A line running direct n. and s. would give a length of 1474 m.; and another at right angles to this, 1355 m.; but one drawn diagonally from its north-eastern extremity through Yun-nan would measure 1669 miles. The area of China proper is usually given as 1,297,999 sq.m.; but Dr. Williams considers that the entire dimensions of the 18 provinces, as the Chinese define them, cannot be much under 2,000,000 sq. miles. All these measurements, however, must be taken as mere approximations.

Physical Features.—China has a general slope from the mountains of Thibet to the shores of the Pacific. The two principal mountain-chains divide it into three longitudinal basins, drained by those great rivers for which China is famous. Within its provinces are found alluvial plains, fertile river-valleys, large populous towns, as well as thinly inhabited, hilly, and mountainous regions. To describe its suface more particularly, it may be viewed under its natural divisions of mountainous country, hilly country, and the great plain. The first comprehends more than half the region between the meridian 113° and Thibet. East of this meridian, and to the s. of the Yang-tse-kiang river, is the hilly country, which includes the provinces of Fuh-keen, Keang-se, Kwang-tung, and a portion of Hu-nan and Hu-pih; while to the n.e. stretches the great plain. This latter extends from the great wall to 30° n. lat.; a line drawn from King-chow in Hu-pih to Hwae-king on the Yellow river, may be considered its western limit; and the

ASIA

British Miles
0 100 200 300 400 500 600 700 800 900 1000

Geographical Miles
0 100 200 300 400 500 600 700 800 900 1000

Longitude East of Greenwich

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sea forms its boundary on the east. This vast and generally fertile tract has an area of 210,000 sq. miles, and supports a population of 177 millions.

From the mountains of Thibet two grand ranges stretch across China, having a general direction from s.w. to n.e. The more northerly of these—the Thsin-ling or Blue mountains—are included between the parallels of 31° and 34°. The southern or Nan-ling chain is a spur of the Himalayas. Commencing in Yun-nan, it bounds Kwang-se, Kwang-tung, and Fuh-keen on the n., and passing through the province of Che-keang—where some of its peaks reach the height of 12,000 ft.—enters the sea at Ning-po; thus forming a continuous barrier—penetrated only by a few steep passes, of which the Mei-kwan, or Mei Pass, is the best known—that separates the coast-land of south-eastern China from the rest of the country. This great chain throws off numerous spurs to the s. and e., which, dipping into the sea, rise above it as a belt of rugged islands along the southern half of the Chinese sea-board. Of this belt, the Chusan archipelago is the most northerly portion.

The magnificent *river-system* of China is represented by those noble twin streams, the Hoang-ho or Yellow river, and the Yang-tse-kiang, which, springing from the same water-shed, the eastern mountains of Thibet, are widely separated in their mid course, but enter the sea within 2° of each other. The former has its source in $35\frac{1}{3}^{c}$ n. lat. and about 96° e. long.; and after a very tortuous course, empties itself into the ocean in lat. 34°.* It is a "mighty, impracticable, turbid, furious stream" for the most part, and little adapted for Chinese navigation. But the river most beloved by the Chinese is the Yang-tse-kiang, or "son of the ocean"—more correctly translated, "the son that spreads"—which name is only applied to it by the natives below the commencement of the delta; for above that it is called simply Ta-kiang or Great river. The basin drained by it is estimated at 750,000 sq. miles. Of the other rivers that water the country, the Peiho in the n., and the Choo-keang in the s., are the most noteworthy.

The principal *lakes* of China are five in number—viz., the Tung-ting-hu, in 113° e. long., with a circumference of about 220 m.; the Poyang-hu, in 116 e. long., 90 m. in length by 20 in breadth; the Hung-tsin-hu, in Keang-su; the Tsau-hu, between Ngan-kin-fu and Nankin; and the Tai-hu, in 120° e. long. On these lakes, artificially constructed floating islands, with houses, fields, and inhabitants, animals, and birds, are sometimes seen.

The *Grand Canal* has very greatly facilitated the internal navigation of the country. Until lately the great annual grain-fleet, with its 430,000 tons of rice for the use of the capital, passed from the s. to the neighborhood of Pekin by this great water-way; thus avoiding the storms and pirates of the coast, but the alteration already mentioned in the course of the Hoang-ho, has rendered it comparatively useless. It connects Tien-tsin in Chih-le with Hang-chow in Che-keang; though the canal proper commences in Shan-tung, and its total length is about 650 miles.

Another world-famous structure is the *Great Wall*—called Wan-li-chang (myriad-mile-wall) by the Chinese—which was built by the first emperor of the Tsin dynasty about 220 B.C., as a protection against the Tartar tribes. It traverses the northern boundary of China, extending from $3\frac{1}{2}$° e. to 15° w. of Pekin, and is carried over the highest hills, through the deepest valleys, across rivers and every other natural obstacle. The length of this great barrier is, according to McCulloch, 1250 m. Including a parapet of 5 ft., the total height of the wall is 20 ft.; thickness at the base, 25 ft.; and at the top, 15 ft. Towers or bastions occur at intervals of about 100 yds. These are 40 ft. square at the base, and 30 ft. at the summit, which is 37 ft., and in some instances 48 or 50 ft., from the ground. Earth inclosed in brickwork forms the mass of the wall; but for more than half its length it is little else than a heap of gravel and rubbish.

Geology.—The high lands, where are the sources of the great rivers of China, consist of granitic and metamorphic rocks. These are continued round the s. and s.e. of the country, until they leave a huge basin, through which flow the Yang-tse-kiang and Hoang-ho, occupied by fossiliferous strata. The wild and rugged scenery of the larger portion of China is owing to the predominance of those crystalline and sub-crystalline rocks. The fossiliferous strata exhibit representatives of the various formations. The palæozoic rocks are but sparingly developed in a narrow stripe which runs from near Pekin in a south-westerly curve, to nearly the center of the empire. Cretaceous rocks occur in the valley of the Yang-tse-kiang. Tertiary beds fill up the eastern portion of the immense basin; while extensive districts to the w. of this region, extending to the crystalline rocks in the extreme w., are covered with modern detritus.

Though no active volcanoes are known to exist except one in Formosa, yet indications of volcanic action are not wanting. Salt and hot-water springs are found in Yun-nan; sulphur springs near Foochow; and wells of petroleum in Shen-se and Formosa. The most famous amongst the *minerals* of China is jade or the yu-stone, obtained chiefly in Yun-nan. Coal, limestone, and porcelain clays are abundant. Precious stones are said to be met with in some districts. In Yun-nan, gold is washed from the sands of the

* The Hoang-ho has recently altered its course, and now enters the sea in a somewhat higher latitude. Such changes, causing losses, and entailing expense, are not unusual; and hence this river has been called "China's sorrow."

rivers, and in the same province silver-mines are worked; here, too, is obtained the celebrated pe-tung or white copper. All the commoner metals are likewise found in China. Near the city of Ning-po are extensive stone-quarries.

Vegetable Productions.—Our knowledge of the flora of China has been much advanced by the researches of Mr. Fortune; and his works contain valuable notices of the geography, culture, and varieties of the tea-plant, and of the botany of the country generally. The tea-plant (*thea viridis* and *thea bohea*) is the most important vegetable production of China. See TEA. The tallow-tree (*stillingia sebifera*), the *dryandra cordata* or varnish-tree, the camphor-tree (*laurus camphora*), the Chinese pine (*pinus sinensis*), the Chinese banyan (*ficus nitida*), the funereal cypress—introduced into this country by Mr. Fortune—and the mulberry, are amongst the most important trees of China. The cocoa-nut and other palms flourish on the southern coast. Of the bamboo, which grows as far n. as lat. 38°, there are 63 principal varieties; and it is said that the bamboos of China are more valuable than her mines, and, next to rice and silk, yield the greatest revenue. The various uses to which they are applied is truly astonishing; and, amongst others, the bamboo is famous as an instrument of punishment. The fruits of both the tropical and temperate zones—apples, grapes, pomegranates, mangoes, pine-apples, three species of orange, the lichi, etc.—are found in the country; and camellias, azaleas, and gardenias are natives of the "flowery land." The *nymphæa*, or water-lily, is greatly prized by the Chinese, both for ornament and in an economical point of view. *Agriculture* is held in higher estimation in China than, perhaps, any other country in the world. On the first day of each year, a grand state-ceremony is performed in its honor. The emperor, accompanied by his great officers of state, repairs to the sacred field, and, having offered sacrifices on an altar of earth, he traces a furrow with the plough, and his example is followed by princes and ministers. A like solemnity is celebrated by the governor of every province, who represents the emperor. The agricultural system of the Chinese is rude, but effective; and every inch of arable land is carefully cultivated. Spade-husbandry and irrigation are carried on to a great extent. The Chinese have a strong perception of the value of night-soil as a manure; for, whilst in this country thousands of pounds' worth are annually thrown into the Thames, in China it is everywhere saved, bears a high price, and is collected in a manner exceedingly offensive to European notions. In the northern provinces, the cereals are principally maize, barley, and wheat; but in the south, rice is raised in vast quantities, and forms the staple food of the people. Tobacco and the poppy are also raised in considerable quantities.

Animals.—Very little is really known of the zoology of China. Some of the more ferocious of the carniverous animals still linger in the jungles of Yun-nan, and are occasionally found along the whole of the Nanling range of mountains as far as Ning-po, where there is a mart for their skins. Wild-cats are common in the forests of the south, and bears are still found in the hills of Shan-se. Of the ruminantia, there are the musk-deer (*moschus moschiferus*), the moose-deer, and a few other species. The gold and silver pheasant, the argus pheasant, and other gallinaceous birds, hold a prominent place in the ornithology of China. Fly-catchers, thrushes, grackles, and goat-suckers have their representatives in China, and there are several species of crows, jays, and magpies. Water-fowl inhabit the lakes, rivers, and marshes. The larger reptiles are unknown; but tortoises and turtles abound on the coast, and lizards are plentiful in the south. The ichthyology of China is considered to be one of the richest in the world. Sharks, rays, sturgeons, and other cartilaginous fishes, are common on the coast; and the carp formerly was very plentiful in the lakes and rivers. The goldfish has been introduced into Europe from China. Of insects, the arachnidæ are large and numerous; indeed, a tree-spider captures and kills small birds. Locusts often commit extensive ravages. Silk-worms are highly valued, and reared in large numbers.

In a country of such vast extent—extending from 18° to 40′ n. lat.—the *climate* must vary greatly. Indeed, as regards both climate and productions, China may be divided into three zones—the northern, the central, and the southern. The northern zone extends to the 35th parallel, and includes the fine provinces of Shang-tung, Chih-le, Shan-se, Shen-se, and Kan-su. It produces the grains, fruits, and animals of northern Europe. Here the children are red-cheeked, and the extremes of heat and cold are great. In Chih-le, the winters are very severe; and at that season ice a foot thick renders the rivers unnavigable. The natural productions of this and the contiguous northern provinces are wheat, barley, oats, apples, the hazel-nut, and the potato; they are also rich in wood and minerals. The central zone, the richest portion of China, contains eight provinces—Sze-chuen, Kwei-chow, Hu-nan, Hu-pih, Keang-se, Gan-hwuy, Ho-nan, and Keang-su—and is bounded by the 27th or 28th parallel; tea and silk are its characteristic products; the middle portion is the granary of China, and the eastern part is celebrated for its manufactures of silk and cotton. The southern zone embraces five provinces—Yun-nan, Kwang-tung, Kwang-se, Fuh-keen, and Che-keang. The exchange of its tropical productions for those of the northern zone is an important branch of the internal commerce of the country. Kwang-tung lies partly within the tropics; and the whole province is tropical, both in climate and productions. The following table (no later census has been made) exhibits the situation, area, and population of the eighteen provinces into which China is divided for administrative purposes:

Provinces.	Population, Census of 1812.	Sq. miles	Pop. per sq. mile.
Northern Provinces—			
Chih-le	27,990,871	58,949	475
Shang-tung	28,958,764	65,104	444
Shan-se	14,004,210	55,268	252
Ho-nan	23,037,171	65,104	420
Eastern Provinces—			
Keang-su	37,843,501	44,500	850
Gan-hwuy	34,168,059	48,461	705
Keang-se	23,046,999	72,176	320
Che-keang	26,256,784	39,150	671
Fuh-keen	14,777,410	53,480	276
Central Provinces—			
Hu-pih	27,370,098	70,450	389
Hu-nan	18,652,507	74,320	251
Southern Provinces—			
Kwang-tung	19,174,030	79,456	241
Kwang-se	7,313,895	78,250	93
Yun-nan	5,561,320	107,969	51
Kwei-chow	5,288,219	64,554	82
Western Provinces—			
Shen-se	10,207,256	67,400	153
Kan-su	15,193,125	86,608	175
Sze-chuen	21,435,678	166,880	128
Totals	360,279,897	1,298,079	277

But, according to the *Almanach de Gotha* for 1877, the population of China, properly so called, was estimated at 405,000,000; and of the rest of the empire, including Mantchuria, Mongolia, Tibet, and Corea, 28,000,000—in all, 433,000,000. After Pekin, the capital, the largest cities in China are Canton, Tien-Tsin, Foochow, Hankow, Hang-chow-Foo, Ning-po, Amoy, Shanghai. Recent authorities estimate pop. far less.

Inhabitants.—Ethnologically, the Chinese belong to that variety of the human species distinguished by a Mongolian conformation of the head and face, and a monosyllabic language. See Chinese Language, Writing, and Literature. A tawny or parchment-colored skin, black hair, lank and coarse, a thin beard, oblique eyes, and high cheek-bones, are the principal characteristics of the race. The average height of the Chinaman is about equal to that of the European, though his muscular power is not so great; the women are disproportionately small, and have a broad upper face, low nose, and linear eyes. Of the general character of the Chinese, it is not easy to form a fair and impartial judgment; and those who have resided long in the country, and know them well, have arrived at very different conclusions. M. Huc asserts that they are "destitute of religious feelings and beliefs," "skeptical and indifferent to everything that concerns the moral side of man," "their whole lives but materialism put in action;" but "all this," says Mr. Meadows, "is baseless calumny of the higher life of a great portion of the human race." He admits, indeed, that these charges are true of the mass of the Chinese, just as they are true of the English, French, and Americans; but as amongst these there is a large amount of generosity and right feeling, and also "a minority higher in nature, actuated by higher motives, aiming at higher aims," so also, he maintains, is there amongst the Chinese a similar right feeling, and a like minority who live a higher life than the people generally. See Hiouen-thsang. As regards valor, their annals record "deeds akin to the courage of antiquity;" they have no fear of death, commit suicide as the solution of a difficulty, and endure the most cruel tortures with a passive fortitude; but neither their arms nor discipline enable them to stand before European forces. The Chinese are, as a race, unwarlike, fond of peace and domestic order, capable of a high degree of organization and local self-government, sober, industrious, practical, unimaginative, literary, and deeply imbued with the mercantile spirit. It is to be observed that the inhabitants of China Proper are essentially one people; the differences, except in dialect, being hardly more marked than between the Northumbrian peasant and the Cornish miner. The south-eastern Chinese—the people of Kwang-tung, Fuh-keen, and the south of Che-keang—are the most restless and enterprising in all the eighteen provinces, and may be regarded as the Anglo-Saxons of Asia. In the mountainous districts of the four south-eastern provinces of China, but principally in Kwang-se, are certain tribes who maintain a rude independence, wear a peculiar dress, and are descended from the aboriginal inhabitants of China. Of these, the Meaon-tze are the best known.

The *manners and customs* of the Chinese can only here be glanced at. The *worship of ancestors* is a remarkable and prominent feature in their social life, and is dictated by that principle of filial piety which forms the basis of Chinese society. The rich have in their houses a chamber—a kind of domestic sanctuary—dedicated to their forefathers. Tablets, representing the deceased persons, and inscribed with their names, are here carefully preserved; and at stated seasons, prostrations and ceremonies are performed

before them according to the book of rites. All Chinese worship from time to time at the tombs of their parents. In everything that relates to death and sepulture, the customs of the Chinese are no less singular. They meet their last enemy with apparent unconcern; but whilst their future state troubles them little, they regard the quality of their coffins as of vital importance, and frequently provide them during their lifetime; indeed, a coffin is reckoned a most acceptable present, and is frequently given by children to their parents. "To be happy on earth," say the Chinese, "one must be born in Su-chow, live in Canton, and die in Lianchau"—Su-chow being celebrated for the beauty of its women, Canton for its luxury, and Lianchau for furnishing the best wood for coffins. Yet death is never alluded to in direct terms, but indicated rather by periphrases, such as—the person "exists no more," "he has saluted the age," "ascended to the sky," etc. Banquets are offered to the dead, and pathetic speeches addressed to them. In China, *marriage* is universal, and within the reach of all; but there is a strict separation of the sexes, and betrothal is undertaken by the parents or by professional match-makers. Minute ceremonial observances regulate every step, and frequently the bride and bridegroom see each other on the wedding-day for the first time. Women hold a very inferior position, and are little better than slaves. Polygamy is not recognized by law, but secondary wives are common, especially when the first proves barren. Infanticide, though regarded as a crime, is undoubtedly practiced to some extent, as is proved by edicts issued against it; and parents possess almost unlimited authority over their children. The intercourse of the Chinese with each other, especially of the upper classes, is regulated by a tedious and elaborate etiquette; indeed, they are the slaves of custom, and everything is done by precedent. Many curious instances of Chinese politeness might be cited. The well-bred host presses many things on a visitor, which the latter must never dream of accepting. "A Chinaman," says Mr. Oliphant, "has wonderful command of feature; he generally looks most pleased when he has least reason to be so, and maintains an expression of imperturbable politeness and amiability, when he is secretly regretting devoutly that he cannot bastinade you to death." The *Le-king*, or book of rites, regulates Chinese manners, and is one cause of their unchangeableness; for here they are stereotyped, and handed down from age to age. The ceremonial usages of China have been estimated at 3,000; and one of the tribunals at Pekin—the board of rites—is charged with their interpretation. Chinese cookery, in the use of made dishes, more nearly resembles the French than the English. Birds' nests soup, sharks' fins, deer-sinews, and ducks' tongues, are amongst its delicacies. The wine, or weak spirit (*tsew*), more correctly speaking, used by the Chinese is made from rice; and from this, again, they distill a stronger spirit, the "samshoo" of Canton. The former is drunk warm in minute cups at their meals; tea never appears during a repast, though it may be taken before or after. The Chinese have numerous *festivals;* and perhaps the most remarkable of these is that celebrated at the commencement of the new year, when unbounded festivity prevails. Preparatory to this, debts are settled, and the devout repair to the temples to gain the favor of the gods. The first day of the year may, in one sense, be reckoned the birthday of the whole people, for their ages are dated from it. Visiting is, at the same time, carried on to a great extent, whilest parents and teachers receive the prostrations and salutations of their children or pupils. The festival of the dragon-boats is held on the fifth day of the fifth month; and at the first full moon of the year, the feast of lanterns. In the manufacture of these the Chinese excel; and on the night of the festival, lanterns illuminate each door, wonderful in their variety of form and material.

In the matter of *dress*, the Chinaman exhibits his usual practical sense, and varies the material according to the season, from cotton-wadded or fur-lined coats to the lightest silk, gauze, or grass-cloth. On the approach of cold weather, he lights no fire in his dwelling, but puts on additional clothing until the desired temperature is attained. A tunic or kind of loose jacket fitting close round the neck, and a wide short trouser, are his principal garments. Shoes are made of silk or cotton, with thick felt soles. White is the color of mourning. The Tartar tonsure and braided queue became general with the Mantchu conquest of the country, since which 180,000,000 of men have the hair removed from their heads at short intervals; and as no Chinaman is his own barber, a great number of this calling find employment. The Chinaman is very sparing in his ablutions, and appears to be afflicted with a strange hydrophobia; for cold water, either as a beverage or for washing his person, he holds in abomination. Long nails are fashionable. The custom of the women differs but little from that of the men, and their shoes are the most remarkable part of their toilet. A lady's shoe measures about 3½ in. from the heel to the toe. The feet of the Tartar women are left as nature made them; but amongst the Chinese, all young girls of the better classses are crippled by a tyrant custom. In early infancy the feet are tightly bound, the four small toes being tucked under the sole, of which, after a time, they become a part, and the heel is brought forward. The process is at length complete; stumps have been substituted for the ordinary pedal extremities, and the Chinese lady totters on her goat's feet.

The principal *manufactures* of the Chinese are silk, cotton, linen, and pottery, for which latter they are especially celebrated. The finest porcelain is made in the province of Keang-se. The Chinese invented printing in the beginning of the 10th c., and in 932 A.D. a printed imperial edition of the sacred books was published. The skill of the

Chinese in handicraft is astonishing. Their rich silks and satins, light gauzes, beautiful embroidery, elaborate engraving on wood and stone, delicate filigree-work in gold and silver, carvings on ivory, fine lacquered ware, antique vessels in bronze, and their brilliant coloring on the famous pith paper, command our admiration.

Of the grand modern discoveries in the *physical sciences* the Chinese are profoundly ignorant, and the study of nature is altogether neglected. The Chinaman objects to be wiser than his forefathers, but spends a life-time in studying his classical literature and the sages of antiquity; and here is doubtless one great cause of the homogeneity of the race, and the stereotyped nature of the Chinese mind.

Of *animal physiology and medicine* the Chinese have very crude notions, as is shown by their *scheme* of the human body, in which the heart is placed in the center, with the other organs ranged round it, and their unphilosophical theory of the pulse, which plainly demonstrates that they are ignorant of the true circulation of the blood, and the vascular system in man; hence their practice of medicine must be empirical. Chinese physicians believe that man is composed of five elements; that so long as each maintains its due proportion, health is preserved; but should one gain the ascendency, illness follows, and the equilibrium must be restored by proper remedies. Acupuncture is practiced. The Chinese have had the opportunity of practically testing the superiority of western medical science, by the establishment of English and American hospitals, the introduction of vaccination, and by the publication of popular treatises on physiology and practical surgery, etc., by Dr. Hobson, late of Canton. It is worthy of remark, that these books were eagerly sought after, and excited a deep interest among their *literati;* indeed, the physiology has been twice republished by persons holding high official situations at Canton, and in a preface to the Chinese edition, the publisher observes: "Our science, indeed, cannot compete with that of the philanthropic author."

Government.—In the centralized autocratic government of China, the emperor is absolute in the empire, the governor in the province, the magistrate in the district. The emperor claims no *hereditary* divine right, and is not always the eldest son of the preceding monarch; the ablest son is nominated, but his right to the throne as the *Teen-tze*, or *Tien-tze*, "son of heaven," the *Fung-tien*, "divinely appointed," can only be established by good government, in accordance with the principles laid down in the national sacred books. If, on the contrary, he violates these principles, the people firmly believe that heaven signifies, by unmistakable signs, that their ruler is not its chosen representative. "The rivers rise from their beds, the ground sullenly refuses its fruits, the plains tremble, the hills reel, and the typhoon rages over seas and coasts, all alike uttering a 'Numbered, numbered, weighed and parted,' that requires no interpretation, but is read in anxiety by the people, in dismay and terror by the prince," who seeks by repentance, and a return to the true principles of the government, to avert his doom. The emperor is absolute as legislator and administrator; but he must legislate in accordance with the general principles acknowledged in the country. He also constitutes, in his own person, the highest criminal court. The Chinese possess a carefully digested code of laws, which is added to and modified from time to time by imperial edicts. Their penal code commenced 2,000 years ago, and copies of it are sold at so cheap a rate as to be within reach of people of the humblest means. Death, which the Chinaman prefers to long confinement, is the penalty for a large number of offenses, and in ordinary years about 10,000 criminals are executed. Several modes of torture are legal. The emperor is assisted in governing by two councils—1. *The inner or privy council,* composed of six high officials, three of whom are Chinese and three Mantchus. The four senior ministers exercise functions corresponding to those of an English prime-minister. 2. *The general or strategical council,* which closely resembles our cabinet; being composed of the most influential officers in the capital, who exercise high legislative and executive duties. Under these are six *yamuns* or colleges of government, each charged with a distinct department of government. Over all is the court of general inspection, or the *censorate,* as it is called by foreigners. The mandarins composing this number from 40 to 50; they are "the eyes and ears of the emperor;" for it is their province to see that all officers of the government, provincial or metropolitan, are faithful in the discharge of their respective duties; and they alone have the right to make representations or complaints to the emperor.

The *administrative machinery* of the Chinese is very perfect in its organization, and demands an attentive consideration for the right understanding of the people and government. In each of the 18 provinces is an imperial delegate or governor, who, besides being at the head of the civil jurisdiction, is commander-in-chief, and possesses the power of life and death for certain capital offenses. He is privileged to correspond with the cabinet-council and the emperor. Under the governor are the superintendent of provincial finances, the provincial criminal judge, and the provincial educational examiner; each communicates with his especial board in Pekin. The governor is also assisted by many other judicial and administrative officials. The governmental organization of each province is complete in itself, but in a few instances two provinces—Kwang-tung and Kwang-se, for instance—form a viceroyalty, over which a governor-general, in addition to the governors, exercises authority. Every province is again subdivided into districts, departments, and circuits. The average number of districts in a province is eighty, and each of these is about the size of an English county. A civil functionary,

called sometimes the district-magistrate, presides over this division, and is assisted by several subordinate officers. A group of districts—six is the average number for the whole 18 provinces—forms a department, and is ruled by a prefect, who resides in the *fu* or departmental city. Three departments, on an average, constitute a circuit, of which an intendant (taoutae) has the charge.

The several grades of mandarians, or Chinese government officials (Chinese name, *kwan-fu*), are distinguished chiefly by a different-colored ball or button on the top of the cap. There are twelve orders of nobility confined to the imperial house and clan, and also five ancient orders of nobility open to the civil and military servants of the state. The normal government of China is less a despotism than a morally supported autocracy, and it is in principle paternal. What the father is to his family, that the governor, the prefect, and the magistrate are intended to be, each in his own sphere, to the people; whilst the emperor stands in the same relation to the myriad inhabitants of his vast dominions. In ordinary times, the Chinaman enjoys much practical freedom and can travel through the country without passport, or follow any calling he likes.

The Chinese executive system is based on those noteworthy *competitive examinations*, which are intended to sift out from the millions of educated Chinese the best and ablest for the public service. The first examination takes place every three years in the capital of each department, when the lowest degree—that of bachelor—is conferred on a certain number of candidates from each district. Triennial examinations are held in the provincial capital, presided over by two examiners from Pekin, at which sometimes as many as 10,000 bachelors present themselves, and compete for the degree of licentiate. Some 1200 obtain it, and these may attend the triennial metropolitan examination at Pekin, when about 200 may hope for the coveted degree of doctor, which insures immediate preferment.

Mr. Meadows, the most philosophical, perhaps, of our writers on China, and from whose works the foregoing sketch of the administrative system of the country has been chiefly derived, has entered very fully into what may be termed the *philosophy of Chinese government*, which he sums up in the following doctrines, and believes them to be deducible from the classic literature of the country, and the true causes of the wonderful duration of the Chinese empire. 1. That the nation must be governed by moral agency, in preference to physical force. 2. That the services of the wisest and ablest men in the nation are indispensable to its good government. 3. That the people have the right to depose a sovereign who, either from active wickedness or vicious indolence, gives cause to oppressive and tyrannical rule. And to these he adds an institution—the system of public-service competitive examinations. But, on the other hand, these examinations, by directing the attention of students solely to the ancient literature of the country, to the exclusion of the physical sciences and inductive philosophy, however efficient in producing that wonderful homogeneity for which the inhabitants of the central kingdom are famous, stunt and stereotype the national mind, which, like the dwarfed tree the Chinaman delights to raise in a flower-pot, or the feet of a Chinese girl, can never fully expand.

Education, as the high road to official employment, to rank, wealth, and influence, is eagerly sought by all classes. Literary proficiency commands everywhere respect and consideration, and primary instruction penetrates to the remotest villages. Self-supporting day-schools are universal throughout the country, and the office of teacher is followed by a great number of the *literati*. Government provides state-examiners, but does not otherwise assist in the education of the people. The Chinese have a remarkable reverence for the written character. Waste printed paper is collected from house to house and burned, to preserve it from profanation.

Army.—According to the *Pekin Gazette*, China has a prodigious army, but in reality the greater part figures only on paper. Each province is provided with a military force varying from 8,000 to about 68,000 men. According to Mr. Meadows the average for each province is about 34,500 men, and 640 officers. The governor of a province is also commander-in-chief, and is assisted by a general-in-chief, as well as lieutenants and majors general. The Chinese and Tartar troops form two important divisions of the army. The Tartar garrisons are indeed the real strength of the Mantchu emperor. That at Pekin is 150,000 strong; and 18 others, averaging each about 3,000 men, are dotted about the provinces, forming, with their wives and children, military colonies. These troops, which are armed with good two-edged swords, and serviceable matchlocks, or the national bow, have alone been able to stand against the victorious Tae-ping rebels, and turn them from the capital. According to the most recent statistics (see *Die wirthschaftlichen Zustände im Süden und Osten Asiens*, Stuttg. 1871), the army is composed of 678 companies of Mantchus of 100 men each, of 211 companies of Mongols, of 106,000 Chinese cavalry, and of 500,000 Chinese infantry, besides a large body of irregular militia—in all 858,000 men. The Tartar infantry soldier receives four taels a month, and the trooper four and a half. The marquis de Moges (see baron Gros' Embassy) thinks that "two regiments of chasseurs and two regiments of zouaves would suffice to conquer China." "There is not," he says, "a corps in the empire that could stand fast under a bayonet charge." This, however, is no longer the case. The native troops in all the large cities of the empire are drilled after the European fashion, and armed with the Snider and other breech-loading rifles; and in the opinion of intelligent English

residents, the next Chinese war will be a very different affair from anything that has preceded it.

Navy.—The imperial navy is divided into river and sea-going vessels. The former amount, it is said, to 1900 ships; the latter to 918—with an aggregate number of 188,000 sailors. This force, however, is insufficient to extirpate or even keep in check the pirates who infest the whole coast of China, and the expedient was formerly resorted to of promoting a pirate chief to some high civil employment. Even yet he is sometimes appointed pilot. The Chinese are now building frigates on their own account—another evidence of the stride taken under the regency of prince Kung.

Revenue.—The estimates of the public revenue of China vary greatly, and while they are stated by some to exceed 100 millions sterling, are held by others not to come up to half that amount. Official returns of the Chinese government—intended for a special use—were published in 1844, according to which the revenue amounted to £63,934,713, derived mainly from three sources—customs duties, licenses, and a tax upon land.

Religion.—The Chinese, remarkable in so many ways, exhibit, in the matter of religion, their usual eccentricity. Three forms of belief—the Confucian, the Buddhist, and the Taouist—may be considered the national religions, as they are believed in, more or less, by the great mass of the people. Of these, the Confucian and the Taouist are indigenous, but Buddhism was introduced from India. A struggle for ascendency was long maintained between these religions, but has now entirely ceased; indeed, it is no unusual thing for all three to be professed by the same person, and as they supplement each other, this is not altogether inconsistent. Confucianism is the basis of the social life and political system of the Chinese. It has been professed by all their greatest men, and is still the sole belief of the educated classes. It is, however, less a religion than a philosophy, and does not pretend to treat of spiritual things; hence room was left for other creeds to supply its deficiencies in this respect. The questions to which Confucius replied were: "How shall I do my duty to my neighbor? How can I best discharge the duty of a virtuous citizen?" Funereal temples are erected to Confucius, and though his image is not used as an idol, his tablet is worshiped, and sacrifices of oxen and sheep are offered before it at the vernal and autumnal equinoxes. For an account of Confucius's philosophy, see CONFUCIUS.

Buddhism in China, though extending over the whole country, and influencing more or less the mass of the people, is fast losing its hold on them, and has very little of the power and authority it once possessed. Its edifices are going to decay, and no new ones rise upon their ruins. Its priests are illiterate, and together with their religion, are held in contempt by the philosophic Chinaman. Aged people and women are now its chief devotees. The begging-monk is characteristic. He wears a loose yellow robe and large stockings; at his back is a wallet in which to receive the contributions of the faithful; and he gives notice of his approach by striking his *muh-yu*. The northern form of Buddhism, which differs considerably from that of Ceylon and the Indo-Chinese peninsula, prevails in China. Its sacred books, in common with those of Nepaul and Tibet are written in Sanscrit, or are translations from that language. Amongst other additions to the creed are the western paradise and the goddess of mercy.

Taouism has not more hold than Buddhism on the literate Chinese. Its priests are generally ignorant men, few of them teaching or understanding the real principles of their faith. They practise a mystic alchemy, prepare spells and incantations, and like modern spiritualists, hold intercourse with the dead. When all other remedies have failed with a sick person, the Taouist priests are sometimes sent for to exercise the evil spirit that is supposed to afflict the patient; and they chant prayers from their mystic ritual, amid the din of gongs, drums, flutes, etc. These mystics worship certain stars, which are supposed to influence human life, and also genii, devils, and inferior spirits. They live in temples with their families, and are known by their slate-colored robes. For a fuller account of Taouism and its doctrines and founder, see LAO-TSE.

Besides these three religions, which alone affect the bulk of the people, there is a *ritual state worship*, which regards the emperor and court alone—a kind of philosophic pantheism, an adoration of certain natural objects; but it is a mere ceremonial, and associated with no theological doctrines. Three classes of objects are distinguisned, to which the great, medium, and lesser sacrifices are offered. The first-class includes the heaven and earth. Equal to these, and likewise restricted to the worship of the emperor, is the great temple of imperial ancestors. The medium sacrifices are offered to the sun and moon, the gods of the land and grain, genii, and sages. In the third class are reckoned certain natural phenomena, as well as deceased statesmen and scholars. The emperor appears to acknowledge a supreme Being as king of kings, the rewarder of virtue and the punisher of vice; but still, Chinese philosophy, as fixed by Chu-tze, is atheistical, and deduces "the development of the universe from one unintelligent and will-less principle." Hence all educated Chinese are atheists, at least theoretically, as will be found by arguing with them; but when they speak of human affairs generally, and their own particular lot in life, they exhibit a belief in *teen* as a supreme, intelligent, rewarding, and punishing power.

Between the followers of the three national religions there is not only a total absence of persecution and bitter feeling, but a very great indifference as to which of them a man may belong. It arises probably from religious apathy; yet still it is preferable to

the fanatical zeal and cut-throat earnestness of the Moslem. Amongst the politer classes, when strangers meet, the question is asked: "To what sublime religion do you belong?" and each one pronounces a eulogium, not on his own religion, but on that professed by the others, and concludes, with the oft-repeated formula: "Religions are many; reason is one; we are all brothers." The government is equally tolerant of religious diversity, except where a political design is suspected.

Temples belonging to the three religions are very numerous. Those dedicated to Confucius are funereal in character. The Buddhist temples are crowded with images, and Buddha is represented expounding his doctrine to attentive listeners. The many-storied tower takes the place of the bell-shaped dagoba or relic-shrine of other Buddhist countries.

History and British Intercourse.—The early annals of China, like those of most other countries, belong rather to mythology than to history. Beginning with Pan-ku, the first of all beings, the country was ruled over first by gods, and then god-descended personages, who revealed to men the essential arts of life. Of those mythical rulers the most famous is Fo-hi. The historical period may be said to commence with the Hia period or dynasty, begun by Yu the great about 2200 B.C., although a great infusion of the fabulous still continues. Some date the real history of China from the Tchow or Chow dynasty, which began with Wu-wang about 1100 B.C. It was during the reign of Ling-wang (571–544), one of this dynasty, that Confucius was born. China would seem during this period to have been divided into a number of independent states. The kings of Tsin gradually gained the ascendency, and at last one of them reduced the other states to subjection (247 B.C.), and assumed the title of Hoang, or emperor. It is from the Tsin dynasty that the country has taken its name, Tsina or China. This first emperor finished the great wall (see above), as a protection against the Tartars, who had all along, under the name of Hiong-nu (Huns), been a source of danger and annoyance to the richer and more pacific Chinese. We cannot enumerate the various dynasties that followed, nor the frequent divisions and reunions of the empire, varied by incursions and partial subjugations by the troublesome Tartars. At last, the Mongols or western Tartars, being called in to aid the Chinese (1209), became finally (see KUBLAI KHAN) masters of the whole country (1279), and reigned over it till 1368, when they were expelled by the Chinese, and the Ming native dynasty succeeded, which lasted 276 years, and fell at length through its own misgovernment. A general of the last Ming emperor, who was employed in keeping the Mantchus (q.v.) in check, made peace with them, and obtained their assistance against the native usurper who had deposed his sovereign. The Mantchus established themselves in Pekin (1644), and finally, after a seven years' struggle, acquired the sovereignty of the whole empire. Many of the conquering race now filled the highest offices of state, and owed their position to birth alone. More than one powerful emperor of the race has ably conducted the government of the country; but Hien Fung, who ruled from 1850 to 1861, was reported to have passed his time in a state of drunken imbecility. The late emperor, Tung-chi, succeeded to the throne when only a child five years old, but the government was ably carried on under the co-regency of the empress-dowager, Tze-an, the empress-mother, Tze-sse, and the enlightened prince Kung, brother of Hien Fung. Tsai-Tien, cousin of Tung-chi, ascended the throne in 1875. As he was then only about four years old, the empresses continued to act as regents.

Of recent events in Chinese history, the most remarkable is the rise, progress, and overthrow of the Tae-ping rebels. Their famous leader, Hung-sew-tseuen, was a man of humble origin, and an unsuccessful candidate for government employment. Some Christian tracts, it is said, led him to renounce idolatry, and he founded a society of God-worshipers, which, in the autumn of 1850, was brought into collision with the imperial authorities, and immediately assumed a political character. Hung persuaded himself and his followers that he had received a divine commission to uproot idolatry, extirpate the Tartar intruders in the country, and establish the new native dynasty of Tae-ping, or universal peace. He assumed the title of heavenly or divine prince (Tae-ping-wang, sometimes called Tien-wang), and bestowed the titles of eastern prince, western prince, southern prince, northern prince, and assistant prince on five of his chosen leaders. The fanatical principle of divine revelations and other extravagances followed. They spoke of Tien-na, the wife of the Heavenly Father; they held that Tien-wang was the son of God as really as Jesus, and worshiped him accordingly. Polygamy was a dark feature of their system, the Tien-wang himself having married 30 wives. The course of this religio-political rebellion, the victorious march of the Tae-ping army from Kwang-se to Nankin in 1850–53, and its subsequent career, cannot here be traced. We can only afford room to state, that after a series of wasteful and revolting barbarities, it was finally suppressed in 1865 by the imperial troops, led by British and American officers, of whom the most conspicuous and able was col. Gordon. See TAE-PINGS.

In early times, the Chinese do not appear to have been opposed to intercourse with foreigners; but the conduct of the Spaniards and Portuguese between 1520 and 1570 excited their hostility. The Mantchu government restricted British trade and intercourse to Canton, where it was carried on through the medium of the *hong* merchants on the one side, and the East India company on the other. Differences arose, however, from time to time between these two commercial bodies, occasioned chiefly by the exac-



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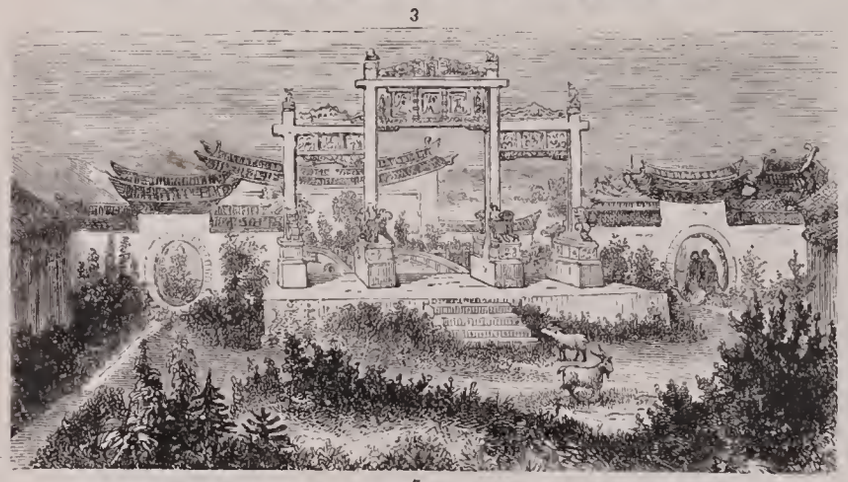
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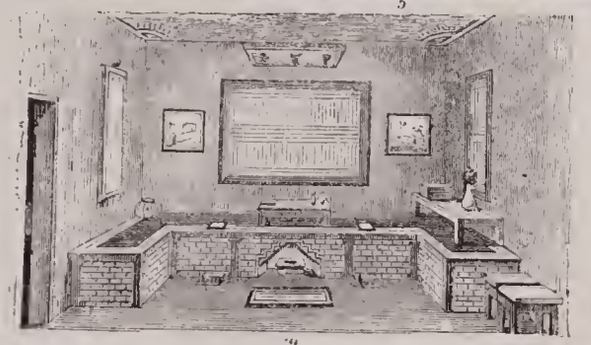
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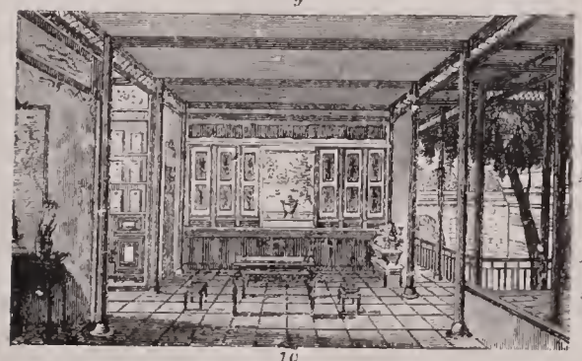
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CHINESE EMPIRE. 1. Emperor Tschien-lung in levee costume (1790). 2, 3. Costumes and people of Southern China. 4. Chinese Empress (1846), from a Chinese painting from life. 5. Chinese funeral. 6. Chinese cemetery. 7. Portal of the pagoda at Semoa. 8. Chinese watchmen. 9. Sleeping-room of an aristocratic mandshu family (Northern China). 10. Sitting-room of a wealthy Chinese family. 11. Chinese warriors. 12. Priest and nobleman of the Liu-Kiu islands. 13. Liu-Kiu chieftain. 14. Mandarin in court-dress. 15. Chinese tragedian.

tions of the mandarins on foreign trade. With a view to a better understanding, the British government despatched to Pekin an embassy under lord Macartney in 1792, and another under lord Amherst in 1816. On the 22d April, 1834, the monopoly of the East India company ceased, and British imperial officers were appointed to carry out the new judicial and fiscal arrangements. Constant dissensions between these and the mandarins continued till the end of the year 1839, when the latter, under pretense of stopping the opium-trade, committed acts of open hostility. A war broke out the following year, at the commencement of which Chinese officials talked of invading England overland, by way of Russia. The imperial government was, however, sufficiently humbled by the middle of the year 1842, and on the 29th Aug., a treaty of peace was signed before Nankin, by which the ports of Amoy, Fu-chow, Ning-po, and Shang-hae were, in addition to Canton, thrown open to foreign trade. The other most important articles of the treaty provided that the island of Hong-kong should be ceded in perpetuity to her Britannic majesty, her heirs and succcssors, and that the emperor of China should pay $21,000,000 towards the expenses of the war.

With five free ports, British trade with China soon assumed gigantic proportions; and though the Chinese evaded the treaty whenever practicable, no important event occurred to interrupt commercial intercourse till 8th Oct., 1856, when the authorities at Canton seized the crew of the lorcha *Arrow*, a vessel registered at Hong-kong, and entitled, it was considered, to British protection. Under pressure from the British forces at hand, the imperial commissioner, Yeh, delivered up the men, but refused all apology. Yeh continuing obstinate, Canton was stormed (Dec. 28, 1857) by the allied French and English forces, and the Chinese imperial commissioner captured (Jan. 5, 1858). The government of the city was still carried on by Chinese officials, but under the authority of the plenipotentiaries and commander-in-chief. The former now proceeded to the n. of China, to put themselves in more direct communication with the imperial government, which still continued obstinate. The forts at the mouth of the Peiho were taken (May 20, 1858), and at length an important treaty was signed at Tien-tsin, June 26, 1858, which stipulates that the queen of Great Britain may (art. ii.) appoint diplomatic agents to the court of Pekin, who (art. iii.) shall be allowed to reside at the capital, where also her majesty may acquire a building site. The Christian religion (art. viii.) shall be protected by the Chinese authorities. British subjects (art. ix.) shall be allowed to travel for pleasure or business to all parts of the interior, under passports issued by their consul. British merchant-ships shall trade (art. x.) upon the Great river (Yang-tze); but as its lower valley is disturbed by outlaws, no port except Chin-keang shall be opened for the present. Chin-keang to be opened in a year from the date of the signing of the treaty.

By this treaty, the vexed question of transit-dues is settled, it being agreed that the British merchant may purchase at the rate of 2½ per cent *ad. valorem*, in the case of imports at the port of entry; and in the case of exports, he may purchase a certificate enabling him to pass his goods, duty-free, to the port of shipment. By a separate clause, the Chinese government agreed to pay two million taels (about £650,000), as indemnity for losses sustained by British subjects at Canton, and a like sum towards the expenses of the war.

The repulse on the Peiho (June, 1859), by a Tartar force concealed in the Taku forts, of the expedition forming the escort of the British and French ambassadors, who were on their way to Pekin, to ratify with the emperor of China the treaty of Tien-tsin, entailed another costly demonstration in the Chinese waters. The Taku forts were captured by the allied English and French forces, Aug. 21, 1860, and Pekin itself in Dec., 1860. The treaty of Tien-tsin was ratified, two additional articles being inserted, one of which legalized coolie emigration. Since 1861, a gradual but beneficial change has come over the spirit of the Chinese government. Prince Kung proved a vigorous and successful regent. The army has been reorganized, and is now subjected to European drill (see par. *army*); a respect for the observance of treaties has sprung up; a national flag has been adopted, and a desire shown on the part of the Chinese to make themselves acquainted with international law. In 1866, arrangements were begun for telegraphic communication between Pekin and the rest of the world; and emigration to all other countries was allowed. Shanghai has telegraphic communication with Europe, and some local lines; but the first Chinese railway opened there in 1876, has unluckily been closed again. Chinese are now found on almost every shore of the Pacific, where their industry, skill, and sobriety secure them abundant employment. They are especially numerous in the Pacific states of the American Union, where harsh measures, including a heavy tax on arriving, have recently been adopted in order to repress Chinese immigration. Between 1855 and 1878, upwards of 200,000 Chinese had, for a longer or shorter time, established themselves in the United States.

Commerce.—The rivers and numberless canals of China are covered with vessels of all sizes, employed in the internal commerce of the country. The Chinese are devoted to traffic, and the Middle Kingdom is throughout its length and breadth a perpetual fair. The total value of the imports into China in 1876 is given at £23,423,190, and of the exports, £26,950,170. Tea and silk are the great staple exports from China. The table gives some recent statistics of British trade with C.:

Year.	Exports from China to Great Britain.	Imports of British Home Produce into China.
1870	£9,481,737	£6,139,633
1873	12,454,234	4,882,701
1875	14,809,632	8,528,311
1877	15,323,342	7,912,663

There is no *coinage* in China except the copper *tchen*, or "cash," which is in value about the tenth of a halfpenny; and all but the most trifling payments are made by a certain weight of silver, or in Mexican or Spanish dollars. Chinese accounts are kept in taels, mace, candareens, and cash. A tael is worth 6*s.* 8*d.*, British currency.

The following works (which have been used as authorities in the preparation of this article) may be consulted for further information on China. Meadows's *Chinese and their Rebellions* (Lond. 1856); Davis's (sir J. F.) *China: a General Description of that Empire* (Lond. 1857); Davis's *China during the War and since the Peace* (Lond. 1852); Williams's *Middle Kingdom* (New York and Lond. 1848); Oliphant's *Narrative of the Earl of Elgin's Mission to China and Japan, in the years* 1857, 1858, *and* 1859 (Edin. 1859); Marquis de Moges's *Recollections of Baron Gros's Embassy to China and Japan in* 1857 *and* 1858 (Lond. 1860); Huc's *Chinese Empire* (Lond. 1858); Cooke's *China in* 1857 *and* 1858; Fortune's *Three Years' Wanderings in China* (Lond. 1847); Fortune's *Visit to the Tea Districts of China* (Lond. 1852); *Edkin's Religious Condition of the Chinese* (1858); Cobbold's *Pictures of the Chinese by Themselves* (1859); *Twelve Years in China, by a British Resident* (1860); *Memoires sur la Chine* (1869); Rev. A. Williamson's *Journeys in North China, etc.* (1870); also Dr. Gray's *China: a History of the Laws, Manners, and Opinions of the People* (1878); and the Freiherr von Richthofen's great work, *China* (1st vol. 1877). See *Supp.*, page 896.

CHINESE EDIBLE DOG. The kind of dog used as an article of food in China, and reared in order to be so used, being esteemed as a delicacy, is a small dog of greyhound-like form, with somewhat terrier-like head, and muzzle more elongated than in terriers. It is fleet and active, gentle and affectionate. The skin is almost destitute of hair; but there is a variety having a crest of long hair on the head, and a large tuft of hair at the tip of the slender and otherwise naked tail.

CHINESE HEMP. See CORCHORUS.

CHINESE IMMIGRATION. See IMMIGRATION.

CHINESE INK. See INDIAN INK.

CHINESE LANGUAGE, WRITING, AND LITERATURE. The Chinese language belongs to those Asiatic languages commonly called monosyllabic, because each word is uttered by a single movement of the organs of speech, and expresses in itself a complete idea or thing. All Chinese words end either in a vowel, a diphthong (in which, however, each vowel sound is distinctly pronounced, making the word often to appear of more than one syllable), or a nasal. Of such simple words or roots there are about 450. But the emphasis or accent of many of these words may be varied by the speaker in four or five different ways, so as to produce a corresponding variety in their meaning, by which means the number of simple words or roots amounts to about 1200. There is no distinction of parts of speech in the Chinese language, and no recognition of the principle of inflection, Chinese words being incapable of any modification of *form*. The relations of words are ascertained by their position in a sentence. Hence Chinese grammar is *solely* syntax. Thus *ta*, according to its position in a sentence, at one time serves the purpose of an adjective, meaning "great;" at another, a substantive, meaning "greatness;" and again of a verb, meaning "to enlarge" and "to be great," or of the adverb "very." There are certain words, however, which have at length lapsed into so vague and general a signification, that in conversation and literature they are now used in some cases as particles to determine the relations of other words; but in the older literature this is very rare, and is against the genius of the language. From what has been said, it will readily be inferred that the gender, number, and case of words are not determined by the *form* of the words themselves. They are, in fact, denoted by the addition of other words. Thus, *people* in Chinese is *multitude man*, *son* is *man child*, *daughter* is *woman child*. *The best of men* is in Chinese *a hundred man good*. The purest Chinese is spoken at Nankin, but the same idiom, called "the language of the mandarins," is spoken by the educated in all parts of the empire. For a knowledge of Chinese grammar, see Schott's *Chinesische Sprachlehre* (Berlin, 1857); Summers's *Handbook of the Chinese Language* (1863); Julien, *Syntaxe Nouvelle de la Langue Chinoise* (Paris, 1870); Morrison's *Dictionary of the Chinese Language* (Shanghai, 1865).

In Chinese the written character, generally speaking, does not indicate the sound of the word, but gives a kind of hieroglyphic or pictorial representation of the idea or thing to be expressed. Hence there are required as many of these characters or symbols as there are ideas to be represented. Since many words similar in sound are different in signification, whilst in writing each idea has its peculiar symbol, the number of words represented by writing—without reckoning those peculiar to certain dialects—is perhaps ten times greater than those distinguished by the ear. The number, in fact, is reckoned at 50,000, but these are far from being all in general use. In writing and

printing, the characters are arranged in perpendicular columns, which follow one another from right to left.

In its origin, Chinese writing is hieroglyphic or picture-writing, with the addition of a limited number of symbolical and conventional signs; the larger number of Chinese characters are formed by the combination of such hieroglyphs and signs. But as one such character by itself seldom determines the sound, an additional word is conjoined for this purpose; so that the great mass of Chinese written words consist of an ideographic and a phonetic element. Native grammarians divide their characters into six classes. The first class comprises simple pictorial representations of sensible objects, such as sun, moon, mountain, etc., and contains 608 characters. The second class includes such characters as are formed by the combination of two or more simple hieroglyphs, which together convey, in a more or less intelligible manner, some other idea: for example, the hieroglyph for sun, combined with that for moon, conveys the idea of light; mouth and bird, that of song, etc.; of these there are 740. The third class embraces those characters which indicate certain relations of position, as above, below, the numerals, etc.; of these there are 107. The fourth class consists of characters which, by being inverted, acquire an opposite signification, as right, left, standing, lying, etc., and contains 372. The characters of the fifth class are termed derived characters; the meaning of the simple or compound characters used to express physical objects, is transferred to mental objects, or to other physical objects with which they are associated, e. g., the hieroglyph for a heart signifies the soul—that for a room, signifies the wife, etc.; of these there are 598. The characters of the sixth class include those which are composed, as above mentioned, of sign and sound. Almost all names of plants, fishes, birds, and many other objects which it would be difficult to represent hieroglyphically, are denoted by the compound characters of the sixth class, which amount to 21,810 in number. As this class, however, consists merely of repetitions of the other five classes, the immense number of Chinese characters may be reduced to 2,425; and whoever learns these may be said to know them all.

The hieroglyphical characters in their oldest form were easily recognizable figures: thus, the hieroglyph for sun was as in the fig. at *a*; for moon, as at *b*; for light, a combination of sun and moon, as at *c*; for to listen, folding-doors and an ear, as at *d*; for white, a very squint eye, in which hardly anything but the white is seen, as at *e*; for friends, the two valves of a bivalve shell, as at *f*. In the course of time, through hasty and careless tracing, the objects denoted by the hieroglyphs have almost ceased to be recognizable. The modern hieroglyphs corresponding to the above are as represented at *a'*, *b'*, *c'*, etc. See Abel Rémusat's "Mémoire sur l'Ecriture Chinoise," in the *Mémoires de l'Académie des Inscriptions*, vol. viii.; and for a view of the Chinese characters, both ancient and modern, Hager's *Monument de Yü* (Par. 1802).



Chinese Characters.

The Chinese literature, in a geographical, ethnographical, and historical point of view, is unquestionably the most comprehensive and important of the whole of Asia. The printed catalogue of the emperor Kien-long's library is composed of 122 volumes; and a selection of the Chinese classics, with commentaries and scholia, which was begun by the order of the same emperor, is said to comprise 180,000 volumes, of which, in the year 1818, 78,731 volumes had already appeared. In the five canonical or classical books, called *King*, are contained the oldest monuments of Chinese poetry, history, philosophy, and jurisprudence, some portions of which belong, perhaps, to the most ancient writings of the human race. Confucius (q.v.), in the 6th c. B.C., collected them from various sources, and in this collection they have been pretty faithfully handed down to us. Next to these in value are the *Sse-shu*, or the four books. These, as they were written by Confucius and his disciples, must be regarded as the most trustworthy source of insight into the intellectual and political life of the Chinese. A complete and elaborate edition of the five *King* and the four *Shoo* has been undertaken by our great English Sinologue, Dr. Legge, under the title of "The Chinese Classics, with a translation, critical and exegetical notes, prolegomena, and copious indexes. In seven volumes;" of which five vols. appeared between 1861 and 1878. A popular edition, under the title of "The Chinese Classics translated into English," has also been published, of which vols. i. and ii. deal respectively with the "Life and Teachings of Confucius" and the "Works of Mencius." Almost contemporary with Confucius lived Lao-tse (q.v.), who was born 604 B.C. He was the founder of a school of philosophy, more spiritual in its character than that of Confucius, but which has now degenerated into the lowest and most vulgar kind of demonology; see *Le Livre de la Voie de la Vertu*, Chinese and French, by Julien (Par. 1842). In mythology, the Chinese have *The Book of the Mountains and Seas*, *The History of the Gods and Spirits*, and some others. In jurisprudence may be mentioned the universal collection of laws, and the criminal code of the present dynasty; see *Ta-Tsing-lu-li, being the Fundamental Laws and Supplementary Statutes of the Penal Code of China*, by Staunton (Lond. 1810). The Chinese literature is also very rich in works on medicine, natural

history, astronomy, agriculture, military science, music, and all branches of mechanics and industry; see *Résumé des principaux Traités Chinois, sur la Culture des Mûriers et l'Education des Vers-à-soie*, by Julien (Par. 1837). In philology, the most valuable works are the dictionaries, in which the Chinese characters have been collected and elucidated by examples from the whole treasury of Chinese literature; but the greatest of all works of this kind is the dictionary of the emperor Kang-hi, which is now regarded as the highest authority for the pronunciation and meaning of the characters. Of the encyclopædias of the Chinese, the most conspicuous are that by Ma-tuan-lin (1300 A.D.), called *Wen-hien-thong-khao*—i.e., an accurate investigation of the ancient documents, with rich supplements; and the *Koo-kin-too-shoo-tsei-ching*, or *Complete Collection of Ancient and Modern Books*—of which latter vast work a copy was secured for the British museum in 1877. But the most valuable portions of the Chinese literature are, undoubtedly, their historical and geographical works, which are indispensable to a knowledge of Upper Asia. Sse-ma-thsian (100 B.C.) compiled, from every recognized authority, a work called *Sse-ki*, or historical memorials, which embraces the history of China from the year 2637 B.C. up to the commencement of the dynasty of Han in the 2d c. B.C. This work has been continued by the different dynasties, and forms a complete collection of the annals of the empire up to the termination of the Ming dynasty in 1643 A.D. It is known under the title of *Nian-eul-sse*, or the 22 histories. The entire collection of the official annals from 2698 B.C. to 1645 A.D., comprising a period of 4343 years, and consisting of 3706 books, is to be found in the library at Munich.

Amid all their scientific labors, the Chinese have not neglected the art of poetry, in which they possess voluminous collections that have yet to be make known to Europe. In lyrical poetry, the most distinguished names are Li-thai-pe and Tu-su, both of whom flourished at the beginning of the 8th c. A.D.; see Davis "On the Poetry of the Chinese," in the *Transactions of the Royal Asiatic Society*, vol. ii. The romantic poetry of the Chinese, although void of poetic beauty, is valuable for the insight it gives into their domestic life. Their dramatic poetry has laws peculiar to itself, and resembles partly the romantic drama of the Germans, and partly the *comedia delle arte* of the Italians. They have also a kind of novel in dialogues, which forms a subordinate species of drama. Besides the speaking persons or actors, there is what they call a singing person, who introduces into the piece songs which he sings to popular melodies, and appears to correspond in a rude way to the Greek chorus. The best collection of works in this species of literature is the *Yuen-dschin-pe-tschong*, i.e., the hundred dramas from the Mongol dynasty (1260–1341), from which all the Chinese dramas known to Europeans have been taken. A Chinese novel, affording a graphic view of the tastes and literary views of that people, was some time ago placed within the reach of European readers by the eminent Chinese scholar Stanislas Julien, under the title of *Les Deux Jeunes Filles Lettrées* (Par. 1860). English readers may also obtain instructive pictures of Chinese life from *Iu-kias-li*, or the Two Fair Cousins, translated from the French version of Rémusat in 1827; and *The Flowery Scroll*, translated, with numerous learned notes, by sir John Bowring, in 1868. But valuable sketches will be found in Schott's *Chinesische Sprachlehre* (1857), Davis's *Chinese Miscellanies* (1865), and Wylie's *Notes on Chinese Literature* (Shanghai, 1867).

CHINESE SEA, or CHINA SEA, that portion of the Pacific ocean which has China and Siam on the w., the island of Formosa, on the n., the Philippines on the e., and Borneo on the s., and which forms the great gulfs of Tonquin and Siam.

CHINESE WHITE. The white oxide of zinc has recently been introduced into the arts, under this name, as a pigment in place of the preparations of white-lead. It changes very little either by atmospheric action, or by mixing with other pigments; but it has not the body of white-lead.

CHINGLEPUT'.—1. A fort, with a t. adjacent, in lat. 12° 41′ n., and long. 80° 2′ e., 36 m. to the s.w. of Madras. It is accessible to an enemy only from the s., having a tank or artificial lake on the e. and part of the n., and rice-fields, irrigated from the same, on the remainder of the n. and on the west. In the dry season the tank is nearly exhausted, the weeds and slime in its bed causing malaria. Notwithstanding this, however, the place is considered to be more than ordinarily healthy. Pop. of town (officially spelt *Chengalpat*) in 1871, 7,979.—2. A district taking its name from the town above mentioned. It stretches in n. lat. from 12° 14′ to 14°, and in e. long. from 79° 35′ to 80° 25′, and contains 2,753 sq. miles. Pop. '71, 938,184. With about 120 m. of coast, it has not a single harbor or anything like shelter from the surf. Nor is its internal navigation of any value. The only considerable river, the Palar, is in most parts destitute of water during the dry season. Excepting in Oct., Nov., and Dec., comparatively little rain falls. From that circumstance, and perhaps also from an inferiority of soil, cultivation is said to be so much circumscribed as to embrace only about 96,000 acres, or $\frac{1}{20}$th part of the entire area.

CHINI', a village of the Punjab, about a mile from the right bank of the Sutlej, the most easterly of the five rivers which give name to the country. It is in lat. 31° 31′ n., and long. 78° 19′ e., and is 8,770 ft. above the sea. Notwithstanding this elevation, it is a delightful place of sojourn, and was a favorite residence of Lord Dalhousie. It occu-

pies a slight depression on the southern slope of a lofty mountain, which fertilizes the soil with a net-work of never-failing rills. The neighborhood is remarkable for the size and flavor of its grapes, while the vines, trained over horizontal lattices, afford, while in foliage, a tolerably continuous shelter.

CHIN-INDIA, or FARTHER INDIA. See SIAM, BURMAH, COCHIN CHINA, *ante.*

CHIN-KEANG-FOO ("River-Guard City"), a Chinese city and port on the Yang-tze-kiang, at the junction of the grand canal with that river, and about 150 m. from its mouth, was opened to European commerce by the treaty of Tien-tsin (1858), and a British settlement was begun in 1864; but trade is very slowly developing, and there is reason to doubt if C. will ever become a place of importance. The anchorage is bad, the port is not a natural outlet for any staple of exportation produced in the neighboring country, and it possesses no advantage as regards the introduction of foreign goods. Formerly, however, as the southern key of the Grand canal, it was both an important stronghold and a center of traffic. The injury which the Grand canal has sustained has for the present practically extinguished the inland trade, and the four years (1853–57) during which it was in the barbarous hands of the Tae-pings are said to have reduced the pop. from half a million to 500.

CHINNOR, a musical instrument of the ancient Hebrews, with 32 strings.

CHINON, a t. of France, in the department of Indre-et-Loire, beautifully situated on the Vienne, 25 m. s.w. of Tours. It has the remains of a huge old castle, formerly the occasional residence of the Plantagenet kings of England, and also of some of the French sovereigns, and celebrated as the place where Joan of Arc commenced her historical career, and as the birthplace of Rabelais. C. has manufactures of druggets, serges, earthenware, etc. Pop, '76, 4,536.

CHINOOKS, Indians of n.w. North America who once inhabited the region around Columbia river, in Oregon. They are now nearly extinct.

CHINQUAPIN. See CHESTNUT and OAK.

CHIN'SURA, a t. on the right bank of the Hooghly, about 20 m. above Calcutta, in lat. 22° 53′ n., long. 88° 23′ east. Pop. along with Hooghly, '71, 34,761. It contains the Hooghly college, and is considered one of the healthiest places in Bengal. It was originally a Dutch settlement, but was ceded in 1824 to the British, along with some other places on the mainland, in exchange for the English possessions in the island of Sumatra.

CHINTZ, a highly glazed printed calico, with a pattern in many colors on a white or light colored ground. It is chiefly used for bed-hangings, for covering furniture, and other purposes where gay colors are desired, and where there is much exposure to dust, which does not adhere to its highly calendered surface.

CHI'O. See SCIO.

CHIOCOCCA, a genus of tropical and sub-tropical plants, of the natural order *cinchonaceæ,* of which two species in particular, *C. anguifuga* and *C. densifolia,* the former a trailing herb, and the latter a bushy shrub, enjoy a high reputation in their native country, Brazil, as cures for snake-bites. An infusion of the bark of the root is certainly one of the most violent emetic and drastic medicines known, its action being accompanied with spasmodic agitations of the whole frame and other symptoms, such as to preclude its use except in the most extreme cases. Yet it had at one time a high reputation in Europe, and was administered in small doses as a diuretic and purgative.

CHIOGGIA, or CHIOZZA, an important commercial t. and seaport of northern Italy, in the province of Venice, stands on an island of the same name in the Adriatic, and is connected with the mainland by a stone bridge of 43 arches. The pop., amounting to (1872) 26,336, are chiefly engaged in the coasting-trade, in lace-making, and in ship-building.

CHION, OF HERACLE'A, one of Plato's pupils, who sought to liberate his native city by slaying the tyrant Olearchus, but the friends of the tyrant slew the conspirators and the oppression of the people became still greater.

CHIO'NIS and **CHIO'NIDÆ.** See SHEATH-BILL.

CHIP HATS. See BRAZILIAN GRASS.

CHIPMAN, DANIEL, LL.D., 1762–1850; brother of Nathaniel; educated at Dartmouth college and began law practice in Vermont in 1790. He was a member of the legislature and of congress, and professor of law and jurisprudence in Middlebury college from 1806 to 1816. He was the first official reporter of the decisions of the supreme court of the state, and the author of *An Essay on the Law of Contracts for the payment of Specific Articles.*

CHIPMAN, NATHANIEL, LL.D., 1752–1843; a native of Connecticut, educated at Yale, served as a lieut. in the revolutionary army, and was present at the battle of Monmouth. He was admitted to the bar in 1779, and began practice in Vermont, where he became chief-justice of the state. In 1791, he was a member of the convention called to decide whether Vermont should join the union, and was one of the commissioners to arrange for the state's admission. Washington appointed him judge of the U. S. court for the district of Vermont. In 1797, he was chosen U. S. senator, and in 1813, he was again

elected chief-justice of the state. He was afterward for 27 years professor of law in Middlebury college. Among his published works are *The Sketches of the Principles of Government;* a volume of *Reports and Dissertations;* and *Principles of Government—a Treatise on Free Institutions, including the Constitution of the United States.*

CHIPMUNK, the common name of the ground squirrel, *tamias striatus,* especially in the New England and northern states. See SQUIRREL, *ante.*

CHIPPENHAM, a parliamentary and muncipal borough in Wiltshire, in a valley on the left bank of the upper part of the Bristol Avon, on the Great Western railway, 22 m. e. of Bristol. It consists chiefly of a well-built street above half a mile long. A bridge of 21 arches crosses the Avon here. C. is famed for its markets of cheese and corn, its cheese market being one of the largest in Britain. There are silk and woolen manufactures, and some mineral springs in the vicinity. Population of parliamentary borough (1871), 6,875; of municipal, 1387. It returns one member to parliament. C. was the seat of the Saxon kings of Wessex. Abont 880, the Danes took it from Alfred, and kept it two years.

CHIPPEWA, a co. in n.e. Michigan, on lakes Huron and Superior and the straits of Ste. Marie; 1500 sq.m.; pop. '80, 5243. The surface is hilly, and mostly covered with pine forests. Co. seat, Sault Ste. Marie.

CHIPPEWA, a co. in s.w. Minnesota, on the Minnesota, Chippewa, and Chetomba rivers, reached by the St. Paul and Pacific railroad; 2,445 sq.m.; pop. '80, 5408. Productions, almost entirely agricultural. Co. seat, Chippewa City.

CHIPPEWA, a co. in n.w. Wisconsin, on the head-waters of the Chippewa river; 4,000 sq.m.; pop. '80, 15,492. The surface is varied, and to a great extent covered with forests. Lumbering is the chief business. Co. seat, Chippewa Falls.

CHIPPEWA, a village in the province of Ontario, Canada, at the junction of the Chippewa with the Niagara river, 2 m. above the great falls. It was here that gen. Scott defeated the British, July 5, 1814. The Americans had 1900 men, of whom 68 were killed and 267 wounded; the English had 2,100 men, of whom 138 were killed and 365 wounded.

CHIPPEWA RIVER, in Wisconsin, rising in the n.w. part of the state and emptying into the Mississippi just below lake Pepin. Its length is about 200 miles.

CHIPPEWAYS. See INDIANS.

CHIPPING BIRD, or CHIPPING SPARROW, *Spizella socialis,* a common American bird, 5 or 6 in. long, white underneath, back and sides ash color, with stripes of black and white. Its half-dozen notes of song are repeated with great rapidity.

CHIQUICHIQUI PALM, *Leopoldinia piassaba,* the PIASSABA of the n. of Brazil, and one of the palms which yield the piassaba (q.v.) fiber, now so much used for making brushes. The piassaba fiber exported from Pará is all obtained from it. It grows in swampy or occasionally flooded lands on the banks of the Rio Negro and other rivers of Venezuela and the n. of Brazil; and has a crown of very large, regularly pinnate leaves, with smooth slender stalks. The leaves, like those of many other palms, are much used for thatching. The commercial fiber is obtained from a remarkable covering of the stem; formed of marginal processes of the leaf-stalks, elongated into ribbon-like strips, and interlaced, finally splitting into fine fibers, hanging down 5 or 6 ft., and entirely concealing the stem, so as to give the tree a very extraordinary appearance. It twists readily into cordage, and the fiber has been long used for cables of canoes on the Amazon and other rivers. Before the independence of Brazil, the Portuguese government had a factory on the Rio Negro, for the manufacture of cables of this fiber. The export of the unmanufactured fiber from Pará to England began about the middle of the present century.

CHIQUIMU'LA, ISTHMUS OF, in Central America, to the s.e. of the peninsula of Yucatan, in long. 89° west. Its breadth from the Caribbean sea to the Pacific is about 150 m.—the greatest elevation not exceeding 2,000 feet.

CHIQUIMU'LA, a department of Guatemala, running from the Caribbean sea along the Honduras border; 4,000 sq.m.; pop. about 75,000. The river Motagua runs through the middle of C. and empties into the gulf of Honduras at San Tomas de Castillo, one of the best ports in Central America.

CHIQUI'TOS, a nation of Indians once very powerful in South America, inhabiting the region w. of Paraguay river. Early explorers described them as an intelligent, warlike, and independent people, living in families, subsisting by agriculture and by the chase, very numerous, and having ample material resources. The Spaniards first invaded their country in 1525, and there were frequent wars with little advantage to the whites. The first permanent white settlement among them was not effected until 1691, when a Jesuit mission was established. The missionaries soon obtained great influence over them, and agriculture and arts prospered, and a considerable trade grew up with the adjoining Spanish settlements. The missions were prosperous until the expulsion of the Jesuits in 1767. Thereafter the Indians rapidly deteriorated, and within a third

of a century following the abandonment of the missions two thirds of the C. nation had disappeared.

CHIRA'TA, CHIRETTA, or CHIREETA (*agathotes chirayta,* also known as *Ophelia chirata*), an officinal plant belonging to the natural order *gentianeæ,* and possessing properties similar to those of the common gentian, the centaury, and other plants of that order. It is a native of the mountains of the n. of India. The whole plant is intensely bitter, and has been long used in its native country as a tonic and stomachic. It is also in high estimation with European practitioners in India as a febrifuge, and is often used by them as a substitute for cinchona. The medicinal virtues reside both in the herb and root. The whole plant is pulled up at the time when the flowers begin to fade, and is dried for use. It is now imported to some extent into Britain.

CHIRICAHUA (INDIANS). See page 897.

CHIRIQUI', a name of various application in Central America.—1. A province on the isthmus and in the state of Panama, Colombia; area 500 sq.m.; pop. 18,000.—2. A river flowing towards the n.—the lat. and long. of its mouth being about 9° n., and 82° 30′ east.—3. A spacious lagoon with three entrances, and with a depth of water for the largest ships, which receives the river. It measures 90 m. along the coast, and 40 or 50 in width.—4. An archipelago between the lagoon and the Caribbean sea.

CHI'ROMANCY, fortune-telling by a study of the human hand (always the left hand), once widely believed in and still practiced to some extent. The points to be observed are the lines, the projections, the joints, the nails, and the contour of the thumb and fingers. The principal line is *the line of life,* running in a curve from the upper joint of the forefinger around the ball of the thumb to the joint of the wrist. If this line shows four distinct and equal furrows near its beginning at the forefinger joint, the person is promised an easy attainment of wealth and honor. If the line be regular and deeply colored, a long and happy life is predicted; if it be freely marked, tortuous and broken, it foretells ill health and short life. If short perpendicular lines run from the line of life toward the palm of the hand, the person may be expected to go on a long journey; if toward the wrist, to be exiled. If the line of life be narrowed but long and strongly colored, it indicates ingenuity and wisdom; a deep line, equally colored, denotes a malicious disposition; and if separated near the center by sharply defined cross lines, it is a sign of approaching death. The next important line is *the line of health,* starting with the line of life and running nearly or wholly across the middle of the hand. If the line be clear and unbroken, it indicates excellence of body and mind; if it be broken and feeble, timidity and ill health are indicated. *The line of fortune,* or *happiness,* is below the line of health, and runs from the base of the fore to the base of the little finger. When this line is distinct and straight it indicates happiness and pleasant temper; if it begins close to the upper side of the hand, it indicates pride; if red in the upper section, envy is foreshadowed; a cross line, so that the two form an upright cross, indicates generosity; if broken and crossed by small lines near the middle, it indicates duplicity. Another line not found in all hands is *the line of the joint,* or *line of the triangle,* extending from the base of the little finger to the middle of the joint of the wrist. When this line is clear, it promises great success after much difficulty. The *mountain of Venus* is the elevation at the base of the thumb, and when smooth and unfurrowed a happy temperament is indicated. The *mountain of Jupiter* is the fleshy projection at the base of the forefinger; that of *Saturn* at the base of the middle finger; that of the *sun* at the base of the ring finger; that of *Mercury* at the base of the little finger, and that of the *moon* is the elevation or bunch on the lower side of the hand. When these mountains are clear and smooth, the indications are: of Jupiter, a heart inclined to virtue; of Saturn, love of labor, and simplicity of character; of the sun, eloquence and vivacious temperament; of Mercury, firmness in men, and modesty in women; of Mars, courage and heroism; of the moon, a tranquil disposition inclined to melancholy. The lines and shades on the mountains have their significance. Small lines near the little finger, parallel with the line of fortune, indicate happy wedded life, and some say their number foretells the number of children. One more line is called *the milky way,* running downward on the mountain of the moon from the wrist joint toward the little finger; if it be long and clearly defined, it foretells success in studies or in arts or fortune in a distant land. Small white spots under the nails indicate the fulfillment of wishes, at near or remote periods as they are far or near the roots. Aristotle regarded C. as a distinct science; the Roman soothsayers, and even the emperor Augustus, practiced it; in the middle ages it was studied with alchemy and astrology by the greatest philosophers; the church tolerated it while condemning astrology, or its interference with the doctrine of human liberty. No longer regarded as scientific, it presents at least a curious study.

CHI'RON, or CHEIRON, the most famous of the Centaurs (q.v.). In the ancient works of art, C. of course appears as half-man, half-animal; but his features, instead of expressing mere savage and sensual strength, as those of the Centaurs generally do, are marked by a mild wisdom, in harmony with the character and deep knowledge attributed to him by the Greek mythologists.

CHIRONEC'TES, a genus of salt-water fishes remarkable for their grotesque forms. The mouse-fish may be taken as a specimen.

CHIR'RA POON'JEE, a t. in the n.e. of India, in lat. 25° 14′ n., long. 91° 45′ east. It stands on the Cossya hills, at the height of 4,200 ft. above the sea, and has a temperature during the hot months 20° F. lower than that of the plains of Bengal. Notwithstanding this, however, the place has proved unsuccessful as a sanatorium. The vicinity abounds in mines of coal and iron, which may be profitably worked.

CHI'RU, *Antilope Hodgsoni,* a species of antelope, inhabiting the pine-forests and elevated open plains of Thibet, in regions bordering on the limits of perpetual snow. It is much larger than the chamois, being about 5 ft. in length, and the height at the shoulder about 3 ft. The C. lives in great herds, and seems to exceed almost all the other gregarious ruminants in watchfulness against the approach of danger. Sentinels are constantly posted to prevent surprise.

CHISA'GO, a co. in e. Minnesota, on the Wisconsin border; 450 sq.m.; pop. '80, 7982. It is intersected by the Lake Superior and Mississippi railroad. The principal productions are wheat, corn, oats, hay, and butter. Co. seat, Chisago City.

CHISELHURST, a parish in Kent, England, 11 m. s.e. of London. It was here that Napoleon III. fixed his residence in 1871, and died, Jan. 9, 1873. His widow, the empress Eugenie, dwells in Chiselhurst (1880).

CHISHOLM, CAROLINE (JONES), b. England, 1810; a noted philanthropist who settled in Australia in 1838 and founded at Sydney schools and asylums for destitute girls. In 1841-45 she procured employment for more than 11,000 persons, and lent in small sums about $6,000, of which all but $120 was returned. In her honor the people of Sydney founded the "Family Colonization Society." She d. 1877.

CHIS'WICK, a village in the center of Middlesex, 7½ m. s.w. of St. Paul's, London, on the left bank of the Thames. Pop. '71, 8,508. Around C. are many fine villas, extensive market-gardens, to supply London, and the gardens of the London horticultural society.

CHI'TIN forms the skeleton of all insects and crustaceans. In insects, it constitutes not merely the external skeleton, the scales, etc., but also forms their tracheæ, and thus penetrates into the most remote portions of their organs; indeed, one of the layers of their intestinal canal consists of chitin. Hence, we can make good preparations of these parts by treating insects with a solution of potash, which dissolves all but the C.: in this way, we can microscopically examine the most delicate parts, as, for instance, the valves of the tracheal openings.

In a state of purity, it is a white amorphous body, which usually retains the form of the tissue from which it is prepared. It has been analyzed by C. Schmidt, Lehmann, and other chemists. Schmidt considers that its composition is represented by the formula $C_{17}H_{14}NO_{11}$. The best method of obtaining C. is by boiling the elytra of the cockchafer with water, alcohol, ether, acetic acid, and alkalies. The substance left after these respective boilings is pure chitin. It seems to be identical with the substance termed by Lassaigne *entomaderm.*

CHI'TON, a Linnæan genus of mollusks. Linnæus, regarding merely the shell, placed them in the class of multivalves, a class entirely artificial. They are now regarded as constituting a family (*chitonidæ*) of gasteropodous mollusks, of the order *cyclobranchiata* of Cuvier, and as occupying a place in systematic arrangement close to limpets. The shell is composed of eight narrow, transverse, calcareous pieces, overlapping each other in a row along the back, and strongly attached to the mantle, which is remarkably fleshy and fibrous. They have the power of rolling themselves up into a ball. The organ of locomotion is an oval foot, more or less wide, according to the species, and extending the whole length of the animal. More than 200 species are known; they occur in all climates, most abundantly on rocks at low water, but some of them at great depths. Some of them creep along the sand. All the British species are small; but some foreign ones grow to 3 or 4 in. in length. The fry of these mollusks swim about by means of long vibratile cilia.

CHITTAGONG, a maritime district in Lower Bengal, taking its name from its capital below mentioned. It is bounded on the s. by Arracan, and on the w. by the bay of Bengal, and stretches from lat. 20° 45′ to 23° 25′ n., and from long. 91° 32′ to 93° east. It has an area of 2,498 sq.m., with a pop. (1871) of 1,127,402. C. (properly *Chattagrám*) also gives name to a *division;* area, 13,592 sq.m.; pop. 3,444,874. In the forests of C., large numbers of elephants are annually caught.

CHITTAGONG, or ISLAMABAD (the second name having been conferred by Aurungzebe, who captured it towards the close of the 17th c.), a city of India, standing on the Kurrumfuli, about 7 m. from its mouth, in lat. 22° 20′ n., and long. 91° 54′ east. It came into possession of the British, along with Bengal proper, in 1760-65. But having originally formed part of Arracan, it was claimed, after a lapse of sixty years, by the Burmese emperor as a dependency of that territory—a claim which formed one of the grounds of the war of 1824. Through the results of that contest, C. diminished in importance, but some European merchants began to settle there in 1864, and its prosperity is returning. In 1873, it exported 104,565 tons of rice. Its ship-building business is now transferred in great measure to Moulmein, in Tenasserim. Pop. '71, 20,604.

CHITTAGONG HILL TRACTS, a district on the e. frontier of British India, between 21° 13′ and 23° 47′ n., and 91° 46′ and 92° 49′ e.; 6,882 sq.m.; pop. '72, 69,607; among whom were only 31 Christians. The region is hilly, with deep ravines and prominent cliffs, covered with gigantic creeping plants. The crops are rice, corn, tobacco, and cotton.

CHITTAGONG WOOD, the wood of *chickrassia tabularis*, a tree of the natural order *cedrelaceæ*, a native of the mountainous countries to the e. of Bengal. In some parts of India, it is called *cedar* or *bastard cedar*, names, however, which are also given to other kinds of wood. C. W. is much valued in India, and is used for all purposes for which mahogany is used in Britain. It makes beautiful and light furniture, but is apt to warp in very dry weather. Beautifully veined and mottled pieces are occasionally met with, and are highly valued.

CHITTELDROOG, or CHITRADURG, a t. in British India, in the province of Mysore, 280 m. w.n.w. of Madras. It is in a fertile plain, and was once one of the strongest places in India. The present fortress crowns a high rock in the rear of the town, and is a formidable defense. Hyder Ali besieged C. in 1776, getting possession eleven years later, but then only through treachery.

CHITTENDEN, a co. in n.w. Vermont, on lake Champlain; 517 sq.m.; pop. '80, 32,798. It is drained by the Winooski and Lamoille rivers, and traversed by the Central Vermont, the Rutland and Burlington, and the Burlington and Lamoille railroads. The productions are wheat, corn, oats, potatoes, hay, cheese, butter, wool, and maple sugar. Co. seat, Burlington.

CHITTENDEN, MARTIN, 1766–1840; son of Thomas; a graduate of Dartmouth college, and for many years in judicial offices in Vermont. He was chosen to congress in 1803, and four times thereafter; and was governor of the state from 1813 to 1815.

CHITTENDEN, SIMEON BALDWIN. See page 897.

CHITTENDEN, THOMAS, 1730–97; the first governor of the state of Vermont, b. in Conn., where he was a member of the legislature. In 1774, he settled in Vermont, and participated in all the political action of the people in councils and conventions, until the territory became a state, before and after which period he was the governor.

CHITTOR′, the name of two fortified towns in India.—1. C. in the district of Arcot, about 80 m. to the w. of Madras, in lat. 13° 12′ n., and long. 79° 9′ east. It stands on the s. or right bank of the Puni, an affluent of the Palar, and is about 1100 ft. above the sea. Its river varies, according to the season, from a small rivulet to an expanse of 400 yards in width. When the stream is at its lowest, the very tanks, as well as the deserted channel, become little better than slime—the result being fever, ague, dysentery, and other diseases. The thermometer has occasionally reached 140° in the sun; but the annual range in the shade runs from 56° to 100°.—2. C. in Odeypoor, or Mewar, about 270 m. to the s.w. of Agra, in lat. 24° 52′ n., and long. 74° 41′ east. The fortress occupies the summit of an isolated rock of nearly 6,000 yards in length, and of 1200 in breadth, which is scarped all round to a depth of 80 or 100 feet, about a fourth part of its entire altitude. Within the inclosure are several antique structures—such as temples, tanks, a palace, commemorative pillars, and an inner citadel.

CHITTY, JOSEPH, 1776–1841; a lawyer of England whose text-books have been considered almost necessary for students and young practitioners. The chief of his works are, *Treatise on the Parties to Actions and to Pleadings; Treatise on the Law of Nations relative to the Legal Effects of War on the Commerce of Belligerents and Neutrals, and on Orders in Council in Licenses; Political Treatise on Criminal Law;* and *Synopsis of Practice in the King's Bench and Common Pleas.*

CHIU′SA, LA, a t. of n. Italy, province of Cuneo, situated on the left bank of the Pesio, 8 m. s.e. of Coni. It has manufactures of silk and glass, and a pop. of 3,000.

CHIU′SA, LA (so called from the ground having been originally *inclosed* as pasture-land for horses), a t. of Sicily, in the province and 30 m. s.s.w. of Palermo, on the slope of some hills. The t. was built in 1320. Agates are found in the vicinity. Pop., 6,840.

CHIU′SI, a t. of central Italy, province of Siena, 37 m. s.e. of Siena, with a pop. of 3,000, stands on an eminence in the Val di Chiana, not far from the lake of the same name. In ancient times, under the name of *Clusium*, it was one of the twelve republics of Etruria, and the residence of Porsena (q.v.). When Italy was overrun by the barbarians, C. fell into decay, the whole valley was depopulated, and became the pestilential pool described by Dante. Since the improvement of the course of the Chiana (q.v.), C. has begun to flourish again along with the whole district. But it is in connection with the discovery of Etruscan antiquities that C. is chiefly heard of. Within the last quarter of a century, immense quantities of these remains have been found in the neighborhood in the grottos that served the ancient Etruscans as tombs. There are three museums in C. filled with them, and a great number are in the public gallery at Florence. They consist chiefly of sun-dried earthenware vases, black, and partly covered with mythological figures. Excavations still continue to be made, but discoveries have become rarer of late years.

CHIVALRY (Fr. *chevalerie*, from *chevalier*, a knight or horseman), the system of knighthood, together with the privileges, duties, and manners of knights. The social arrangement to which this term is applied seems first to have assumed the character of a positive institution during the 11th c.; but so far from being an invention of that period, it had its roots in the manners of the Germanic races, amongst whom it ultimately arose, at the earliest period at which they are historically traceable. In the description which Tacitus has given us of the manners of the Germans, we find the most unequivocal indications of the existence, not only of the general spirit, but, in a partially developed form, of many of the special arrangements of chivalry. But it was in connection with feudality that C. attained to its full proportions, and in many respects it must be regarded as the complement of that institution. See FEUDAL SYSTEM. Whilst feudality exhibits the political, in C. we see the moral and social side of the arrangements of mediæval life. It was in the feudal mansions of the barons that the system was developed; and to the lay portion of the youth of the higher classes, the instruction which they there received in the usages of C. formed by far the most important part of education. In addition to the martial accomplishments, which corresponded to those of a modern cavalry-officer, they were instructed in the political relations which subsisted between the vassal and his lord, by which the whole body of society was then bound together; and in what might almost be called a system of ethics, strangely enough exhibiting unmistakable traces of the stoic philosophy. The analogy between the severer virtues recommended to the special cultivation of their disciples by the followers of Zeno, and those inculcated on the novice in C., and practiced by the knights of the middle ages, might be ascribed to other than historical causes, were it not that we are able to trace the connection between them with something approaching to certainty. If any one wishes to convince himself of the truth of our assertion, let him compare the last production of the intellectual life of antiquity with one of the earliest and most important of our own literature, the *Consolations of Philosophy* of Boethius with Chaucer's *Testament of Love*. The resemblance is so close, that the latter work has, not without reason, been regarded as an imitation of the former; but the main features which distinguish them, and mark Chaucer's work as belonging to the modern world, are more instructive than even their similarity. The place which Philosophy, the celestial consoler, occupies in the work of Boethius, in that of Chaucer is supplied by *Love*—a being whom we must in nowise confound either with the heathen goddess, or, as some have done, with the divine love of the Christian religion. She is neither more nor less than the embodiment of an abstract idea which formed the central point of the whole system of C.; and her substitution for the philosophy or reason of Boethius is very characteristic of a state of society in which the affections and passions, rather than the intelligence, were the motive principles. The "Love" of Chaucer is a complete generalization, altogether independent of individual object, and the consolation which she proffers to her votary is that of enlisting in his favor the special guardian, the "Margarite," who is supposed to watch over his individual fortunes. The "Margarite" seems to correspond to the chivalrous idea of the *Lady-love*, in its purest sense, when its reference to a person was by no means indispensable, but when it signified rather "the love of woman," the highest object of the knight's ambition. Under the protection of this guardian spirit, the lover is represented as altogether sheltered from the caprices of fortune, and in her name he has a dose of rather frigid comfort administered to him, greatly resembling that which Boethius receives at the hands of Philosophy. Such is the general idea of the book, and it is a noble idea, embracing the very essence of society as it existed then, and presenting a much deeper view of that singular institution C. than is usually to be met with in writers who have not been actually brought in contact with its influences. But to the two elements which we have mentioned as ingredients in the spiritual life of C., the Germanic traditions on the one hand, and those of classical antiquity on the other, a third falls to be mentioned, which was, perhaps, the most important of all—that of Christianity as represented by the church. The clergy were too fully aware of the importance of early impressions, not to seize on the imagination of the aspirant to C. at the all-important moment of his inauguration. The purifications, prayers, and vigils, the sacrament and the vows by which this solemn rite was accompanied, are detailed elsewhere (see KNIGHT, BANNERET, BATH, etc.); and their influence in casting a religious character over the whole institution of C., and occasionally in directing its energies specially to the propagation of Christianity, by means of the various religious orders of knighthood and the crusades, is well known. Nor was the poet behind the priest in availing himself of the influences of C., and developing them in the region of the imagination. What Chaucer has exhibited in the work to which we have referred, may be regarded rather as the philosophical than the poetical side of the institution. But to poets of a lighter and more imaginative cast of mind, C. has furnished, from the days of the troubadours down to the present poet-laureate, no insignificant portion of their subject-matter. King Arthur and his knights of the round table, the traditions regarding whom had been taken from a period altogether mythical, and long anterior to the existence of C. as an institution, became to the poetry of the middle ages very much what the heroes of the Trojan war were to that of the whole ancient world. Much astonishment has often been expressed at the contrast between the lofty and ideal purity of the code of morals inculcated by C., and the gross-

ness of the lives of the men who were trained under its influences The case is one which in a remarkable degree proves the practical importance of the inculcation of sound doctrinc, for the practice gradually, though slowly, conformed itself to the principles; and it is probably in no insignificant degree to thc elevated tone of the latter that wc owe the moral superiority of the modern over the ancient world.

CHIVALRY, Court of, a military court, established by Edward III., of which the earl marshal and the lord high constable were joint judges. When held before the earl marshal alone, it was merely a court of honor; but when both were present, it was also a criminal court. Having encroached on the common law, its jurisdiction was defined by 13 Rich. II. stat. i. Under this act, the court claimed power to give relief to such of the nobility and gentry as think themselves aggrieved in matters of honor, and to keep up the distinctions of degrees and quality. In criminal cases, a jury was sworn; but in general the proceedings of the court were summary matters, being brought under its cognizance by complaint or petition. An attempt was made to revive the functions of the court in queen Anne's time; but, except as represented by the earl marshal's court (see College of Arms), it has now gone into abeyance.

CHIVAS'SO, a small city of Piedmont, northern Italy, situated in a fertile plain on the left bank of the Po, about 15 m. n.e. of Turin. It was formerly a place of considerable military importance, but its fortifications were destroyed in 1804 by the French. The lampreys of C. are celebrated throughout Piedmont. It has manufactures of bricks, earthenware, soap, etc., and a trade in the agricultural produce of the district. Pop. 4,800.

CHIVE, or Cive, *Allium schœno'prasum,* a plant of the same genus with the leek and onion (see Allium), a perennial, ½ to 1 foot in height, with very small, flat, clustered bulbs, increasing by its bulbs so as to form a sort of turf. The leaves are tubular, cylindrical-tapering, radical, nearly as long as the almost leafless flowering-stem, which is terminated by a hemispherical, many flowered, not bulbiferous umbel of bluish red, or, more rarely, flesh-colored flowers. The stamens are included within the perianth. This rather pretty little plant grows wild on the banks of rivers, and in marshy or occasionally flooded places in the middle latitudes of Europe and Asia. It is a rare native of Britain. In some of the mountainous districts of Europe a variety is found, larger and stronger in all its parts, and with flowering-stems more leafy. Chives—the name is generally used in the plural—are commonly cultivated in kitchen-gardens, often as an edging for plots, and are used for flavoring soups and dishes. Their properties are very similar to those of the onion. The part used is the young leaves, which bear repeated cuttings in the season.

CHIZEROTS and BURINS form one of those peculiar races in France that live isolated in the midst of the rest of the population, and are despised and hated by their neighbors. They live in the arrondissement of Bourg-en-Bresse, in the department of Ain; and the communes of Sermoyer, Arbigny, Boz, and Ozan belong to them. According to tradition, they are descended from the Saracens. Although industrious and prosperous, they are held in the utmost contempt and detestation by their peasant neighbors, who are often indolent and destitute. They are looked upon as covetous and malicious, and scarcely would the daughter of a small farmer, or well-to-do day-laborer, become the wife of one of them, so that they mostly marry among themselves. From time immemorial, the C. and B. have been field-laborers, cattle-dealers, butchers, etc. Many of them are very good-looking. The young women are handsome, clear-complexioned, with large black eyes. See Michel, *Histoire des Races Maudites de la France et de l'Espagne* (2 vols., Par. 1847).

CHLADNI, Ernst Florens Friedrich, founder of the science of acoustics, was b. at Wittenberg, Nov. 30, 1756. He studied law in his native place, and also in Leipsic, where, in 1782, he was made doctor of laws. C. ultimately abandoned judicial studies altogether, devoted his mind to natural science, and, being acquainted with music, was led to observe that the laws of sound were by no means so well established as those of other branches of physics. He therefore began to apply his knowledge of mathematics and physics to acoustics, and traveled for 10 years (after 1802) through Germany, Holland, France, Italy, Russia, and Denmark, giving lectures on the subject, which were very successful. He died in Breslau, April 3, 1827.—C.'s writings include *Discoveries concerning the Theory of Sound* (1787); *Acoustics* (1802); *New Contributions to Acoustics* (1817); and *Contributions to Practical Acoustics, with Remarks on the making of Instruments* (1822). C. also wrote several essays on meteoric stones.

CHLAMYDOSAU'RUS, a lizard of Australia, which has on its neck a singular mantle or plaited frill covered with scales and edged with spines. When full grown, this lizard is nearly 3 ft. long.

CHLAMYPH'ORUS (Gr. chlamys-bearing; *chlamys,* a soldier's cloak), a very remarkable genus of mammalia of the order *edentata,* ranked by naturalists in the same family with the armadillos, but differing in important respects from them, and from all other known quadrupeds. Only one species is known, *C. truncatus,* 5 or 6 in. long, a native of the interior of Chili, living underground like the mole, which it much resembles in its habits, and feeding on the same kind of food. Its forefeet are adapted for digging,

although in a different manner from those of the mole. The skull is destitute of sutures; there are resemblances to the osteology of birds in the ribs and their union to the sternum; the hinder part of the body is altogether unlike that of any other known animal, in its terminating quite abruptly, as if cut off almost where its thickness is greatest, or as if the back were suddenly bent down at right angles, the tail not springing from where the line of the back appears to terminate, but far below. The whole upper and hinder parts of the body are covered with a coat of mail, made up of a series of square plates; the under parts and legs are covered with long silky hair. The tail is very peculiar; it is covered with small scales, is expanded at the tip, and is usually incurved along the belly, but is furnished with such muscles as to suggest the probability of its being employed to throw back the earth in excavations.

CHLAMYS, an outer garment worn by the Greeks and some other people of the east. It was of wool, smaller than the more common blanket, of finer material, and often of brilliant colors. It was an oblong square, twice as long as its width. The wearer fastened the corners of the shortest side to the middle of the chest, the chlamys falling down over the back to the knees; or when fastened on the right shoulder it fell over the left arm and side. The chlamys for women often had a fringe or border of rich colors.

CHLOPICKI, Joseph, a Polish general, and dictator of Poland during the revolution of 1830, was b. in Galicia in 1772. He entered the army in 1787, attracted the notice of Kosciusko during the first insurrection of the Poles, and after the storming of Praga, 9th Nov., 1794, when the hopes of the patriots were extinguished for a while, he passed into the service of the new Cisalpine republic, and distinguished himself in various battles. In 1806, when Bonaparte called the Poles to arms, C., among others, obeyed, and fought gallantly at Eylau and Friedland. He was subsequently sent by the emperor into Spain, and in 1812 followed him to Russia, taking part in the bloody engagements at Smolensk and Moskwa. After the relics of the invading force had returned, C. left the imperial service, on account of receiving certain slights in the way of his professional advancement. After the taking of Paris by the allies in 1814, he led back to Poland the remains of the Polish troops who had fought under Bonaparte, and was well received by the emperor Alexander, who made him a general of division. When the second insurrection of the Poles broke out in 1830, C., who foresaw the hopeless nature of the attempt, concealed himself; but the voice of the nation called him forth from his hiding-place, and on the 5th Dec., 1830, he was elected dictator. His moderate views, however, involved him in disputes with the extreme patriotic party, and on the 23d Jan., 1831, he resigned his office; but, to prove his sincerity, he entered the Polish army as a simple soldier, and took part in the murderous battles at Wavre and Grochow. After the suppression of the insurrection, C. went to Cracow, and withdrew altogether from public life. He died at Krzeschowitz, 30th Sept., 1854.

CHLO′RAL ($C_4Cl_3HO_2$) is a body formed when anhydrous alcohol is acted upon by dry chlorine gas. It is an oily liquid with a peculiar penetrating odor.

CHLORAL (*ante*), a liquid prepared from absolute alcohol by the action of dry chlorine. It is composed of carbon, hydrogen, oxygen, and chlorine, formula C_2HOCl_3. Combined with water, it forms chloral hydrate, a transparent crystalline substance, having the appearance of alum, sometimes administered to induce sleep. Its effect is attributed to chloroform produced in the system from the chloral by the alkaline reaction of the blood. As a rule 20 grains causes in a healthy adult a light and refreshing sleep, after about half or three quarters of an hour, without headache or other bad results. Repeated use blunts the good effect, and causes serious nervous demoralization; overdoses have caused death. Chloral hydrate has special value where the use of opium is inadmissible; also in delirium tremens, mania, rheumatism, gastralgia, and as antagonistic to tetanus and the effects of strychnia. Yet it is seductive and dangerous.

CHLORANTHA′CEÆ, a natural order of exogenous plants, closely allied to the peppers; herbaceous and half shrubby plants, with jointed stems, opposite simple leaves, and minute stipules between them. The flowers are in terminal spikes, and are destitute of calyx and corolla, but have each a small scale or bract. The stamens are lateral; either only one or few, and partly cohering. The ovary is one-celled, immediately crowned with the stigma; the ovule is pendulous; the fruit a drupe or one-seeded berry; the embryo naked, not in a fleshy sac as in the peppers.—The number of known species is small: all of them are tropical, or natives of China and Japan. They are generally aromatic, and some of them, as species of *chloranthus* in the East Indies, and of *hedyosmum* in the West Indies and South America, are used as antispasmodics, stimulants, stomachics, and tonics. The roots of *chloranthus officinalis* and *C. brachystachys* have been ranked among the most efficacious remedies in fevers and other diseases requiring continual and active stimulants, and instances have occurred of great benefit from their employment during the prevalence of epidemics in Java. *C. inconspicuus* is the Chu-Lan of the Chinese; its leaves, spikes of flowers, and berries are used by them for imparting a peculiar fragrance to tea. All the teas which have what is called the *cowslip flavor* owe it to this plant.

CHLO'RIC ACID (ClO_5) is a compound of one atom of chlorine and five atoms of oxygen, and is generally met with in combination with potash, as the white crystalline salt, chlorate of potash (KO,ClO_5). This salt is mainly interesting from the readiness with which it parts with its oxygen to combustibles, as when thrown on red-hot charcoal, when it causes violent deflagration. The salt is employed in the fabrication of certain kinds of lucifer-matches, which give a slight explosion when struck. If a crystal of chlorate of potash be placed on a piece of paper saturated with turpentine, and a drop or two of oil of vitriol added, it causes the inflaming of the turpentine with explosive rapidity. The chlorate of potash is also used in medicine, with the view of imparting oxygen to the blood.

CHLORIC ETHER, a name formerly given to a compound of chlorine and olefiant gas, also called chloride of ethylene, or *Dutch liquid*. Now applied to a mixture containing one part of chloroform and eight or nine parts of strong alcohol. Dr. John C. Warren's "chloric ether," used by him as an anæsthetic, contained one part of chloroform and two of alcohol. C. E. is used as a means of administering chloroform internally; it is a mild anodyne, useful to allay restlessness and spasmodic disturbances, as of the air-passages.

CHLORIM'ETRY, or CHLOROM'ETRY, is the process of estimating the proportion of available chlorine in bleaching powder (q. v.), which may vary from 20 to 36 per cent. The process depends upon the great power with which chlorine, in the act of being liberated from its compounds, causes the oxidation of many substances. The salt generally used is pure crystallized sulphate of iron, which, in its ordinary state, gives a deep blue color, with a drop of ferridcyanide of potassium, but ceases to do so when it has been fully oxidized, or converted from a proto-salt into a per-salt, through the influence of chlorine. It being known that 78 grains or parts of sulphate of iron are oxidized by 10 grains or parts of chlorine, the mode of procedure in C. is as follows: 78 grains of fine crystals of the sulphate of iron are dissolved in water slightly acidulated with hydrochloric acid in a white porcelain basin. A given quantity of the bleaching powder—say 50 grains—is dissolved in a little tepid water, and introduced into a tall measure-glass called a chlorimeter or burette, similar to an alkalimeter, which is divided into 100 parts, and water added till the solution rises to the top mark. After subsidence of the insoluble matter, the clear solution is very gradually poured into the solution of sulphate of iron in the basin, the whole being kept constantly stirred, and every now and again a drop of the iron solution is taken out and placed on a new drop of ferridcyanide of potassium placed on a white plate; and whenever the iron solution ceases to produce a deep blue, and only forms a light greenish-yellow tint, it is known that the iron has been fully oxidized by the chlorine. Suppose that at this stage the burette has been emptied to the 55th division; as we know that the liquid poured out must have contained 10 grains of chlorine, we can calculate the chlorine contained in the whole; for

$$55 : 10 :: 100 : 18.18.$$

Thus 50 grains of the powder contain 18.18 grains of chlorine, or 36.36 per cent. Protochloride of manganese, subchloride of mercury (calomel), or a solution of indigo of known strength, may be employed instead of the sulphate of iron; but the latter is preferable, and is generally employed by chemists and manufacturers.

CHLO'RINE (Gr. *chlōros*, pale green) is a non-metallic element discovered by Scheele in 1774, and named by him *dephlogisticated marine air*. Afterwards, in 1810, Davy proved it to be an elementary body, and gave it the name which it now bears. In nature it is always found in a state of combination. United with sodium (Na), it occurs very largely as the chloride of sodium (NaCl)—common salt—in the ocean; in large beds, as rock-salt; in all natural waters, including even rain-water; in clays, soils, limestone; in volcanic incrustations; and in the vegetable and animal kingdoms. The preparation of gascous C. by its liberation, directly or indirectly, from common salt, has been fully described under BLEACHING POWDER, which is the form in which C. is prepared and employed commercially. For experimental purposes, the gas may be received in jars filled with water at the pneumatic trough, when the C. rises into the jar, and displaces the water. When thus obtained, it is a yellowish-green gas with a peculiar and suffocating odor, is not combustible, and a very feeble supporter of ordinary combustion. A lighted candle placed in it burns with a very smoky flame, owing to the hydrogen of the oil alone burning, and the carbon being liberated. Several of the metals, such as antimony, copper, and arsenic in a fine state of division, or in the condition of thin leaves, at once become red hot, and burn when introduced into the gas. A piece of thin paper soaked in turpentine likewise bursts into flame. C. has the symbol Cl, and the atomic weight or equivalent of 35.5. It is a very heavy gas, nearly 2½ times heavier than air, its specific gravity being 2,470 (air=1000); it is soluble in cold water to the extent of two volumes of C. in one of water, and yields a solution resembling the gas in color, odor, and other properties. The principal properties of C. are those of a bleacher of cotton and linen (see BLEACHING), and a most powerful disinfectant (q.v.). The gas can be condensed by pressure and cold into a transparent dark greenish-yellow limpid liquid, with a specific gravity of 1330 (HO=1000), which also

possesses bleaching properties, and a most powerful odor. On the animal system C. acts, in very minute quantity, by producing a sensation of warmth in the respiratory passages, and increasing the expectoration; in large quantity, by causing spasm of the glottis, violent cough, and a feeling of suffocation. The workmen in chemical manufactories, who get accustomed to the C. in small quantity, are generally stout—at least, lay on fat—but complain of acidity in the stomach, which they correct by taking chalk, and also suffer from the corrosion of their teeth, which are eaten away to stumps. The antidotes to the evil effects of the introduction of C. into the lungs are the inhalation of the vapor of water, alcohol, ether, or chloroform; but the two latter should never be resorted to except under medical supervision.

C. unites with the metals and many other substances to form an extensive class of salts known as *chlorides*.

CHLO'RITE (Gr. *chlōros*, green), an abundant mineral, consisting of silica, alumina, magnesia, and protoxide of iron, in somewhat variable proportions. It is of a green color, rarely occurs crystallized in hexagonal crystals, sometimes foliated like talc. It is rather soft, and is easily broken or scratched with a knife. Before the blow-pipe, it is with difficulty fused on thin edges. It is readily distinguished from talc by yielding water in a closed tube.

CHLO'RITE-SCHIST, or CHLORITE-SLATE, a green slaty rock, in which chlorite is abundant in foliated plates, usually blended with minute grains of quartz, and sometimes with feldspar or mica.

CHLO'RODYNE is a patent or quack medicine of considerable popularity, invented by a Dr. Collis Browne, but largely imitated by various chemists. It contains opium, chloroform, prussic acid, and probably Indian hemp, and is flavored with sugar and peppermint. As it is apt to separate into two liquids on standing, it should never be taken unless it has previously been well shaken; and as, in taking a dose of chlorodyne, the patient swallows an unknown quantity of three or four of the deadliest poisons with which we are acquainted, it is always advisable to begin with small doses. It is unquestionably a compound which sometimes succeeds in allaying pain and inducing sleep, when opiates have failed; but whether a physician is justified in recommending a remedy with the composition of which he is unacquainted, is a doubtful question. Ten or fifteen drops is the average dose.

CHLO'ROFORM, or the TERCHLO'RIDE OF FORMYLE (C_2HCl_3), was originally discovered by Soubeiran, and experimented upon by Dumas, and was long known only to scientific chemists as a rare organic body, possessing interest from being one of a series of organic substances, but not known to possess any properties likely to call it into use, or even likely to let it be known by name to the general public. The remarkable power, however, which it possesses of producing anæsthesia, has led to the preparation of C. on a very extensive scale. The materials employed are alcohol, water, and bleaching powder, and the proportions are four parts of bleaching powder, to which sufficient water is added to make a thin paste, and thereafter one part of spirits of wine; the whole is introduced into a capacious retort, which must not be more than half filled, and heat being applied, the C., accompanied by water and a little alcohol, distills over. As the C. is heavier than water, and is not readily miscible therewith, two layers of liquid are obtained in the receiver—the upper being water and alcohol, and the lower being chloroform. The upper liquid being cautiously poured off, the C. is agitated with fused carbonate of potash, which abstracts the remaining traces of water, and on subsequent redistillation the C. is obtained pure and ready for use.

C. is a highly limpid, mobile, colorless liquid, which is very volatile, has a characteristic and pleasant odor, and an agreeable sweetish taste. It has a specific gravity of nearly 1500 (water = 1000), being thus half as heavy again as water, and boils at 140° F. It is not inflammable in the ordinary sense of the term, as it will not take fire when a light is brought down upon it; but when thrown on red-hot coals, it burns with a green flame, evolving much smoke. It is slightly soluble in water, but more readily mixes with alcohol and ether. It dissolves camphor, amber, copal, and other resins, wax, caoutchouc, black and red sealing wax, iodine and bromine, as well as strychnine and other alkaloids. Its purity may be determined by placing some on the palm of the hand, and allowing it to evaporate, when no alcoholic or other odorous substance should be even momentarily recognized; and by agitation with oil of vitriol, when, on settling, the C. should readily swim on the surface of the vitriol, and the two layers of liquid remain colorless. The employment of C. as an anæsthetic has already been considered under ANÆSTHESIA; but it may be here repeated that C. is a substance that cannot be too cautiously dealt with, and that it should never be administered except in the presence and by the sanction of a medical practitioner. When skillfully given, it is among the safest of all anæsthetics, and the greatest boon that chemistry has bestowed on suffering humanity.

CHLORO METH'YL, or METHYLENE BICHLORIDE, CH_2Cl_2; a liquid—clear, volatile, of pleasant odor; when inhaled, producing anæsthesia more quickly than chloroform, and usually free from disagreeable consequences. Like chloroform, not absolutely safe.

CHLO'ROPHYLL (Gr. *chlōros*, green, and *phyllon*, a leaf), the substance to which the leaves and other parts of plants owe their green color. It is somewhat analogous to wax, is soluble in alcohol and ether, but insoluble in water, and floats in the fluid of the cells, in the form of minute granules. Light is indispensable to its formation, and hence arises the familiar phenomenon of blanching (q.v.), either from accidental causes, or by the art of the gardener. Young leaves do not exhibit so deep a green as those which have been longer exposed to the light; and the green of a leaf generally deepens till it begins to change into the tints of autumn. *Hydra viridis*, and other minute animals, appear to owe their green color to a substance analogous to chlorophyll.

CHLO'ROPS. See CORN-FLY and WHEAT-FLY.

CHLORO'SIS (Gr. *chlōros*, pale green), a peculiar form of anæmia or bloodlessness, common in young women, and connected with the disorders incident to the critical period of life. It has been called the *green sickness*, from the peculiar dingy greenish-yellow hue of the complexion; the green color, however, is not always characteristic. The disease is attended with very great debility, and often with breathlessness, palpitation, and other distressing or even alarming symptoms. When there is no organic disease present, however, C. may be pronounced curable in a large proportion of cases. The principal means to be employed are air, exercise, often salt-water baths, the use of iron, with a nutritious and rather stimulating diet, and purgatives if required; together with such special remedies as are adapted for restoring deficient secretions, and bringing the entire female system of organs into a natural condition.

CHLORO'SIS, a diseased state of plants, in which a sickly green or greenish-yellow color takes the place of the natural lively hue. Sometimes only a particular shoot is affected by it, but very generally the whole plant; and it seems to depend upon causes which render the plant altogether unhealthy, the pallid appearance being merely symptomatic, and not only the formation of chlorophyll, but all the functions of vegetable life being languidly and imperfectly carried on. Bad seed, damp soil, and cold wet weather, appear to be the most common causes of chlorosis. Plants affected by this disease are often to be seen among crops generally healthy; but whole crops of grain, potatoes, etc., sometimes perish from it, or are much diminished in value. Fruit-trees also suffer from it.

CHLOROX'YLON, plants of the order cedrelaceæ, the fruit having only three cells and splitting into three parts. The satin-wood of India is a specimen.

CHOATE, RUFUS, LL.D., 1799–1859; a native of Massachusetts, graduated from Dartmouth college in 1819, and a tutor there for a short time. In 1824, he commenced the practice of law in Danvers, soon removed to Salem, and in 1825 and 1827 was a representative and a senator in the state legislature. In 1832, he was elected to congress, and on the expiration of his term, removed to Boston. In 1841, he was chosen U. S. senator to fill Daniel Webster's unexpired term, the latter having been appointed secretary of state. In 1846, he resumed law practice in Boston, and in 1853, was chosen attorney-general of the state. His mind was acute, his scholarship broad and fine, his rhetoric magnificent. For many years he was recognized as the foremost lawyer of New England, and was especially renowned for eloquence in pleading. His more famous efforts were a eulogy on president Harrison, an address on the landing of the Pilgrims, and a eulogy on Daniel Webster. His works and correspondence have been published.

CHOCARD, or CHOQUARD, *Pyrrhocorax*, a genus of birds of the crow family (*corvidæ*), differing from the choughs in having a shorter bill, which, however, is arched like theirs, but resembling them in their habits. The only European species is the Alpine C., also called Alpine chough, and Alpine crow (*P. pyrrhocorax*). It is about the size of a jackdaw, of a brilliant black, with yellowish bill and red feet.

CHOCKS are pieces of wood employed on ship-board to aid in the support of various articles. Amongst them are anchor-chocks, rudder-chocks, boat-chocks, stow-wood chocks, and chocks to support the ends of the beams.

CHO'CO, a bay and province of New Granada, in South America.—1. The bay, forming part of the gulf of Darien, receives the Atrato (q.v.), a stream of note in connection with interoceanic communication. Its lat. and long. are about 3° 30′ n., and 77° 30′ west.—2. The province forms the w. portion of the department of Cauca (q.v.).

CHOC'OLATE is made from the seeds of *theobroma cacao* (see COCOA), reduced to a fine paste in a heated iron mortar, or by a machine, and mixed with pounded sugar and spices, as cinnamon, cloves, cardamom, vanilla, etc. The paste is then poured into molds of white iron, in which it is allowed to cool and harden. C. is sometimes made without spices, but is then more generally called cocoa. The paste is sometimes mixed with flour, and with Carrageen or with Iceland moss; and for medicinal purposes with cinchona, etc. C. is used as a beverage, and for this purpose is dissolved in hot water or milk. Sometimes the yolk of an egg is added, and sometimes it is dissolved in soup or wine. It is also employed in making certain liqueurs. In a pure state, it soon satisfies the appetite, and is very nourishing; when it contains spices, it is also stimulating. Good C. is externally smooth, firm, and shining—not gritty in the fracture—easily soluble, aromatic; not viscid after having been liquefied and cooled, but oily

on the surface, and leaves no sediment of foreign substances. C. is adulterated in many ways, by mixing it with rice-meal, oat-meal, flour, potato-starch, roasted hazel-nuts or almonds, and with benzoin, storax, etc., in place of vanilla. The Mexicans, from time immemorial, were accustomed to prepare a beverage from roasted and pounded cocoa, dissolved in water, and mixed with maize-meal and spices. This they called chocolatl (*choco*, cocoa, and *latl*, water). From the Americans, the Spaniards derived an acquaintance with C., and by them it was introduced into Europe in 1520. C. is used in South America, Spain, and Italy, more than in other parts of the world, although it is used to a considerable extent in Germany. Its use in Britain has given place in a great measure to that of the simpler cocoa.

CHOCOLATE ROOT. See GEUM.

CHOCTAW, a co. in s.w. Alabama, on the Mississippi border; 800 sq.m.; pop. '80, 15,731—8344 colored. It is watered by tributaries of the Tombigbee. Productions chiefly agricultural. Co. seat, Butler.

CHOCTAW, a co. in central Mississippi, on Big Black river; 900 sq.m.; pop. '80, 9036—2500 colored. Agriculture is the chief business. Co. seat, Greensborough.

CHOCTAWS, or CHAHTAS, a tribe of American Indians now occupying a portion of the Indian territory on Red river, numbering about 16,000, and possessing 10,450 sq.m. of land. When first known to Europeans they occupied the country now forming the w. part of Alabama and s. part of Mississippi. When Louisiana was settled they formed an alliance with the French against the Chickasaws and the Natchez. By degrees they became friendly to the English, and in 1786 they recognized the supremacy of the federal government. About 1800, they began to emigrate beyond the Mississippi. In the war with England and the Creek war they did great service to the union. Georgia gave them special privileges, even making them citizens, but they preferred to emigrate, and were all gone soon after 1830. In 1818, missions were established among them. In the civil war, they went with the confederates, but after it was over new treaties were made by the United States, slavery was abolished, and other necessary changes made. They have a regular constitution, prefaced by a bill of rights. Free males 21 years old and six months citizens of the nation are voters. There is a house of representatives of 17 to 35 members chosen for two years. The governor is elected for two years by the people, and is eligible for four years only out of any term of six. There are courts, supreme, civil, and probate; and justices of the peace. Books are printed in their language, and a newspaper is regularly issued every week at their chief town.

CHODOWIE'CKI, DANIEL NICOLAS, 1726–1801; a Polish painter and engraver who designed and engraved subjects from the seven years' war, and subsequently the "History of the Life of Jesus Christ," a series of miniature paintings that made him at once famous. Thereafter he was represented by his work in almost every book of importance published in Prussia in which engravings could be used. Still, the picture of "Calas and his Family" is the only one of C.'s that has wide reputation.

CHŒNIX, a Grecian measure of capacity variously represented as equal to 0.186, 0.248, and 0.495 of an English gallon. It is supposed to have been used chiefly for measuring grain.

CHŒRI'LUS, a Greek tragic writer of the time of Thespes and Æschylus. He was a competitor for the tragic prize in 529 B.C. It is said that he took 13 prizes, and was the author of 150 tragedies, besides other works that have been lost.

CHŒRI'LUS, OF SAMOS, a Greek writer, b. about 470 B.C.; author of a poem treating of the wars of Greece with Darius and Xerxes. Fragments of his writings have been preserved in the works of Aristotle, Josephus, and Ephorus.

CHOIR (Lat. *chorus*). In its literal sense, the C. is the portion of the church devoted to the singers; and in all descriptions which concern the ritual it is so limited, including only the space from the western door or screen to the end of the stalls, whilst the part from the stalls eastward to the high altar is called the presbytery. But in ordinary language, and even as used by architects, it denotes the entire space which is inclosed for the performance of the principal part of the service. In this sense, it includes the C. proper and the presbytery, and corresponds to the chancel in parish churches. Where the church is cruciform, and the term is confined to the eastern limb, it comes to be entirely different from the C. in the ritual sense, or the stall-place, which in such a building is commonly situated either under the tower or in the nave. In large churches, the aisle generally runs along each side of the C., and frequently passes across the e. end of it; an arrangement which is very common in the larger churches of the continent which have polygonal or semicircular terminations.—C. is also the name given to the singers of the choral service.

CHOIR-SCREEN, or CHOIR-WALL, the screen or wall which divides the choir and presbytery from the side aisles. It is often very richly ornamented.

CHOISEUL, CLAUDE ANTOINE GABRIEL, Duc de, 1760–1838; a col. of dragoons during the French revolution, and a warm supporter of the royal cause. He made an attempt to rescue Louis XIV. from the revolutionists, but the royal party was recaptured, a price was set upon C.'s head, and he was compelled to fly. He raised a regiment of

hussars and joined the royalist army. He was finally taken prisoner and confined at Dunkirk. He escaped, and sailed for India, but was wrecked on the coast of France, captured, and condemned to death. Yet he escaped death, and at the restoration he was called to the house of peers by Louis XVIII. In the revolution of 1830, he was a prominent member of the provisional government, and afterwards received from Louis Philippe the post of aide-de-camp to the king and governor of the Louvre.

CHOISEUL-AMBOISE, Etienne François, Duc de, minister of Louis XV., was b. June 18, 1719, educated by the Jesuits, and on the completion of his studies, entered the army. He fought bravely in the Austrian wars of suecession; but only after he had attraeted the faney of the king's mistress, Madame Pompadour, did fortune also really favor him. Through the influence of Madame Pompadour, he was made lieut.-gen. in 1748, ambassador to the courts of Rome and Vienna in 1756, and due de Choiseul in 1758. C. now became instrumental in bringing about a family league of the Bourbon monarchs in Europe; and in 1763, at the close of the war so disastrous to the French arms, he obtained, by his prudence and dexterity, milder terms for his nation than had been expected. This made him very popular, as did also his successful attempt to overthrow the Jesuits. In 1764, Madame Pompadour died, but the power of C. continued unabated. He conceived, and almost earried out, a plan for the formal emancipation of the Gallican church from papal influence, paid great attention to the improvement of the army and navy, developed the trade and industry both of the nation and of the colonies, and opened up anew an intercourse with India, whose native princes were assisted by Freneh officers in their endeavors to expel the British from the peninsula. He had spies in every European court, and so ruled all diplomatic and political cabals, that the empress of Russia, who dreaded him, called him *Le Cocher de l'Europe* ("the driver of Europe"). But the rise of Madame Dubarry, who succeeded Madame Pompadour in the royal affections, gradually alienated Louis from his able minister, and in 1770 he retired to his magnifieent estate of Chanteloup, where he lived in princely splendor. After the accession of Louis XVI., C. received permission to return to Paris. He was often consulted, but never recovered his offieial position. He died May 7, 1785.

CHOISEUL-GOUFFIER, Marie Gabriel Florent Auguste, Comte de, 1752–1817; a French seholar who traveled in the east, and published in 1782 the first volume of his *Voyage Pittoresque en Grèce.* During the revolution he adhered to the royal cause, and afterwards went to Russia, where he was made director of the imperial libraries, and of the academy of fine arts. Another part of his work appeared in 1809, and the concluding portion in 1824, after his death.

CHOKE-CHERRY, a name given to certain nearly allied species of cherry (q.v.), of the bird-cherry section of the genus or sub-genus, natives of North America, having small fruit in racemes, and the fruit at first rather agreeable, but afterwards astringent in the mouth. Some confusion has long existed as to the different kinds, and their botanical names (*prunus* or *cerasus virginiana, serotina,* and *borealis*) are not more determinate than the popular ones. Perhaps they ought to be regarded as mere varieties rather than distinct species. They have a considerable resemblance to the Portugal laurel, although the leaves are deciduous. The bark is used as a febrifuge and tonic, under the name of *wild cherry bark;* and by distilling it with water, a volatile oil is obtained from it associated with hydrocyanic acid, called *oil of wild cherry.* This bark allays nervous irritation, and is particularly suitable as a first tonic in cases of recovery from fever or inflammation.

CHOKE-DAMP. See Carbonic Acid.

CHOKING, the obstruction of the gullet, or of the passage leading to it, by morsels of food imperfectly chewed, or other substanees accidentally swallowed. The consequenees of C. in the human subject are serious, and will be best considered in connection with the parts concerned. See Pharynx and Œsophagus. What follows relates to the C. of cattle.

Causes.—These may be classified under two heads: 1. Those that depend on the material swallowed; and 2. Those that depend on the animal swallowing. Under the first head we find sharp-pointed objects which become fixed into or entangled in the membrane lining the throat and gullet; solid masses too large to pass on to the stomaeh; dry farinaceous materials which clog in the passage. The second class of eauses eonsists in inflammation of the throat, or irritation of the organs of deglutition; constrictions of the passage, as in crib-biting horses; ulceration of the œsophagus, which is apt to run after C., and is the cause of a relapse; lastly, without any disease of the deglutating organs, an animal may be choked by eating too greedily, and imperfeetly masticating or salivating its food.

Symptoms.—These vary according to the position of the obstruction. If high up in the pharynx, the animal cannot swallow, evinces great distress, and attempts to cough up the object. Saliva drivels from the mouth, the animal chews, and makes an ocasional ineffectual effort to swallow. The breathing is very greatly disturbed. In some cases a large lump of food has become fixed in the larynx or upper part of the windpipe, and has suddenly suffocated the animal. When the obstruetion is in the course of the gullet down the neck, the symptoms are very similar, though less urgent, and there is addition-

ally the local sign of swelling, with the peculiar hardness or softness of the substance indicating its nature. When an animal is choked by a substance lodging in the gullet within the chest, the symptoms are more mysterious, and likely to mislead. The animal swallows; a considerable quantity of liquid may enter the gullet, but it is suddenly regurgitated or thrown up, as in the act of vomiting. The distress is great; and in the course of three or four days, unless the animal is relieved, it dies of prostration. In the ox, sheep, and goat, the most alarming symptoms, in any case of C. arise from the paunch becoming distended by gas. This condition will be treated under the head Hoven.

Treatment.—Remove the obstruction with the hand, when you can. Cause the animal to swallow the substance, if possible, by giving it water or oil. Carefully push the offending agent down by a probang, if it is possible to effect this, and if withdrawal by the mouth is impracticable. In some cases, the gullet has to be cut into by a qualified surgeon. After a case of C., keep the animal on soft food, and attend to its general health, in order to avoid a relapse, which is of frequent occurrence in cattle.

CHOL'ERA, a Greek term used in the Hippocratic writings, but of indeterminate etymology, being derived perhaps from *cholē*, bile, or from *cholera*, a water-spout or gutter. It is now universally employed in medicine as indicating one of two or three forms of disease, characterized by vomiting and purging, followed by great prostration of strength, amounting in severe cases to fatal collapse. The variety called *cholera sicca* (dry C.) by ancient writers (in which collapse and death take place without discharges) is comparatively rarely observed. The milder forms of C. occur almost every summer and autumn, even in temperate latitudes, and are hence termed by some—in reference to this country, and by way of contrast—British or summer C.; while the more devastating and fatal forms of the disease are generally supposed to originate only in tropical countries—especially in India—and thence to be propagated epidemically over vast populations, and in a somewhat regular geographical course, reaching this country usually through Persia, the steppes of Tartary, Russia, and the Baltic, at the same time extending to Egypt, Turkey, and the south of Europe. These very fatal forms of the disease are commonly called Asiatic, Oriental, or epidemic C.; sometimes cholera morbus, or pestilential cholera. The milder forms are sometimes also called bilious C.; and the severer, spasmodic C., from the character of the symptoms in each. Some writers of great authority are inclined to consider the two forms as one disease, varying in individual cases and according to season. It is certain that it is not always possible to distinguish the one form from the other in particular instances; but the marked difference between the mortality of groups of cases of British C. on the one hand, and of Oriental or Asiatic C. on the other, renders it probable that there is something in the latter disease which amounts to a distinction in kind. Whether in the milder or severer form C. is usually ushered in by a period of premonitory symptoms, when the more distinctive characters of the disease are not established; the case resembling one of common diarrhea (q.v.) or looseness of the bowels. At this stage it is very apt to be neglected, and unfortunately, in the severer epidemic forms of the disease this is the only stage much under control. Whenever, therefore, there is a reasonable suspicion that epidemic C. is threatened, every person attacked with diarrhea should make a point of placing himself under medical advice, and, if possible, of escaping from any situation in which epidemic disease is known to be prevalent. He should also be particularly attentive to diet, and especially to the purity of the water he drinks, and to its absolute freedom from contamination by animal matters filtering through the soil, or thrown into water-courses by sewers, etc. If water absolutely cannot be had in a pure state, it should be boiled before being used for drink, or indeed for any domestic purpose. Many cases of C., and several local epidemics, have been traced in the most positive manner to organic impurities of the drinking-water; and no single cause of the disease has been established by so much evidence as this. Hence, in all probability, arises the well-known preference of C. for low situations, and particularly for the low-lying flats on the banks of rivers, especially where the inhabitants are supplied with water from streams polluted by sewerage, and wells into which the contents of drains are permitted to filter from a superior elevation. —See Dr. Snow's work on the communication of cholera, 2d edition, 1855; also the report of the registrar-general of England on the cholera of 1848–49, and his 17th annual report, for 1854.

It is hardly within the scope of a work such as this to present a minute description of fully developed C. in its severer or Asiatic variety. It is truly an appalling pestilence* too easily recognized by a few leading features. After some hours or days of simple relaxation of the bowels, vomiting commences, and occurs again and again, accompanied by frequent and extremely copious discharges downwards, at first of matters colored with bile as usual, but in the end of colorless and turbid fluid resembling water in which rice has been boiled. These discharges (often to the extent of gallons of liquid), succeeding each other with the most alarming rapidity, act as a drain upon the fluids of the body generally; and by the changes they effect upon the blood, contribute

* The epidemic of 1848–49 carried off 53,293 persons in England and Wales; and that of 1854, 20,097 persons. See the Registrar-General's report for the latter year. This estimate is exclusive of cases of fatal diarrhea.

to bring about the state called *collapse*. In this condition, the patient lies motionless and apathetic, except when tormented by cramps, which are of frequent occurrence; the surface is cold; the finger-ends, lips, and tip of the nose become livid; the eyes are deeply sunk in the sockets, and often bloodshot; the tongue is clammy; the breath without any sensible warmth when caught on the hand; the pulse is suppressed at the wrist, the breathing extremely slow and feeble, the heart just audible through the stethoscope. Purging and vomiting have ceased; even the urinary secretion has dried at its source. In fact, all the vital processes are nearly brought to a stand, and unless reaction comes, a few minutes, or at most a few hours, suffice to bring life to a close. Reaction in the most favorable cases is gradual and without accident; it is not unfrequently, however, accompanied by fever, closely resembling typhus, and constituting, at least in the temperate zone, one of the chief dangers of the progress of cholera.

Medicine is almost powerless against C., except in the earliest stages, in which the treatment usually pursued in diarrhea (q.v.) has sometimes been found useful. Very remarkable temporary restorative effects have been found to follow the injection into the veins of dilute solutions of saline matter, resembling as nearly as possible the salts of the blood which are drained away in the discharges. Unhappily, these experiments have as yet only very imperfectly succeeded. The patient is restored to life, as it were, from the very brink of the grave; but he revives only for a few hours, to fall back into his former condition.

The true medicine of C., so far as we yet know, is preventive medicine. The measures to be adopted have been partly pointed out above; in addition, it may be said that personal cleanliness is of the first importance; and that all unnecessary contact with the sick should be avoided, as the disease is probably to some extent contagious, though by no means in the highest degree. In short, all the precautions are to be taken which are recommended in the case of epidemic disease (q.v.).

CHOLERA INFANTUM. A disease of infants characterized by intestinal disturbance more or less obstinate and dangerous. Opinion is unsettled in regard to the nature of the complaint, and it passes under different names in different countries. In this country, besides C. I. a common name for it is *summer complaint*, because it is essentially a disease of hot weather. Most British authorities describe it under the general head of diarrhea, others call it weaning brash, watery gripes, and choleric fever of children. In France it has various names, principally alluding to its location, as coloenteritis, follicular enteritis, and gastro-intestinal catarrh, the latter name being also the one in most frequent use in Germany. But the disease as it is known in this country, and doubtless elsewhere, depends upon a variety of pathological conditions, which, however, may change from one to another during the progress of the case. The causes of the complaint are not completely settled, although all the authorities agree that hot and badly ventilated apartments and malaria generally are highly conducive to it. The older American physicians were, with Dr. Benjamin Rush, accustomed to call it infantile bilious remittent fever, and many of the cases which occur in those rural districts where remittent malarial influences prevail have much of the character of remittent fever, but in cities, particularly where the sewerage is bad, and the streets are suffered to be choked with decaying garbage, the diarrhea has more the character of that of typhoid fever, and many of the symptoms are of a general typhoid, that is, of a weak nervous character. Too high a heat maintained in the nursery, will, if continued, probably so alter the functions of secretion as to bring on the disease; especially if the diet is defective, as from poor milk, or the injudicious giving of solid articles of food. It sometimes comes on very suddenly, but is often insidious in its advances, deluding the mother and family with the idea that it is merely a temporary diarrhea that will soon pass away, or can easily be relieved. The attack, however, may commence with violent symptoms, and there will be much excitement of the circulation, with vomiting and purging. There is in all cases great weakness of the digestive and assimilative powers. Milk which has been given but a short time before is voided by the rectum in curds, mixed with greenish slime of various depths of color, and containing fibrinous shreds and gelatinous masses, indicating mucous inflammation, and having a peculiar and diagnostic odor. The evacuations are preceded by colic pains, often intense, the movement usually giving temporary relief. The abdomen may be quite full at first, but gradually, often rapidly, grows gaunt, with more or less rapid emaciation of the whole body. The child becomes peculiarly fretful and impatient, the expression of its features and its general appearance being highly diagnostic to the experienced observer. In advanced stages there is a withered, clammy appearance of the hands, arms and legs, peculiar to the disease. Without change of air or diet, or under bad treatment, the disease usually runs a rapid and fatal course, but sometimes, under fair but not decided treatment, the sufferer lies for several weeks, when, according to statistics, death is more likely than recovery. There is a considerable difference, according to the testimony of practitioners, in the mortality which occurs in the practice of different individuals. In some charitable institutions the deaths of cases of C. I. run as high as 70 *per cent*, even under as good hygienic regulations as may be had in a city, and many private physicians, from the result of their practice, place the percentage of deaths above 50 *per cent*. There are others, and they form a large portion of the profession, who maintain that under their method of treatment the

mortality is much less, ranging on an average from 10 to 25 *per cent,* and even below this. All concur as to the importance of pure air and proper diet. Often the simple removal to a mountainous district will, alone, result in recovery; or even a change from hot to cold weather, without removal, will often produce decided relief. As the digestive functions are very much weakened, the food should be the most digestible which can be obtained, also nutritious. If the case be one in which the child is suckled by the mother, but there is reason to suppose that her milk disagrees with it, weaning may be advisable; but, as a rule, the mother's milk is the best food for a child under 14 months of age. When the child is fed from a bottle, beef tea, made either from fresh beef, or from beef extract, may be given with advantage. Farinaceous articles, such as farina, tapioca, corn starch, and arrow root, are, contrary to the ill-advised conclusions of many, not proper food for infants. The only article of the kind that ever ought to be given in a case of cholera infantum, is rice water, which, from its slight astringent properties, may sometimes be given in moderate quantities together with good milk and beef tea. The radical difference between physicians, in the medical treatment aside from hygienic measures, and aside from any reference to the different "schools" of medicine, consists in the degree of reliance to be placed upon opiates and astringents, or in other words, upon palliative treatment, as distinguished from that which seeks to produce a decided change in the functions of the various secreting organs, a great majority of which are manifestly much deranged in the disease under notice. The bile is scanty and not of normal character, and the inflamed and highly irritated mucous membrane of many parts of the intestinal tract interferes greatly with the functions of the mucous glands of these parts. There has long been a discussion among physicians as to the therapeutical value of mercurial preparations, particularly as to calomel, and its power of influencing the secretion of the liver, and diminishing inflammation. It seems proper therefore to say that in the experience of the most successful physicians it is found that the administration of small and oft repeated doses of calomel in cases of C. I. is attended, as a rule, with decidedly beneficial results; so that in the course of two or three days, frequently in a few hours, a change takes place for the better in the character of the fecal evacuations and in the appearance of the patient. The administration of the calomel alone, given in a little pulverized sugar, slightly moistened and placed on the child's tongue, in quantities from one twelfth to one quarter of a grain, and repeated every two, three, or four hours, will often produce decided relief; but it is generally advisable, or necessary, also to give a slight opiate, such as paragoric elixir, and perhaps a few drops of the tincture or aromatic syrup of rhubarb. The calomel must be persisted in for several days after the evacuations have become natural, although not given so often. It is a rule with but few exceptions among physicians of experience, that an infant cannot be salivated. On the contrary, the child grows strong and hearty under the use of calomel in those cases when the secretions are much deranged and the system reduced. In doses sufficiently small it undoubtedly possesses the power of improving assimilation. Warm baths, or rather warm sponging, and general attention to cleanliness, and the preservation of an equable temperature, should not be neglected. Patients who cannot be removed to the country, may be taken out in an easy carriage and wheeled on the shady side of the street, or in a park or grove.

CHOLES'TERINE is one of those bodies which are termed by chemists lipoids, or non-saponifiable fats. It was originally discovered in gall-stones, but is now recognized as an ordinary constituent (although occurring in very minute quantity) of bile, blood, and the tissue of the brain. It likewise occurs in pus, the contents of cysts, and other morbid fluid products.

It separates from its solutions in glistening nacreous scales, which, when examined under the microscope, appear as very thin rhombic tablets, whose obtuse angles are 100° 30′, and whose acute angles are 79° 30′. Different formulæ have been assigned for its composition, the one generally accepted being $C_{37}H_{32}O$. It is not always very easy of detection in animal fluids, but if, by its insolubility in water, acids, and alkalies, and its solubility in hot alcohol and ether, it has been recognized as a fatty substance, it may be readily distinguished from all similar substances by the measurement of the angles of its rhombic tablets. The best method of preparing C. is by boiling gall-stones containing it in alcohol, and filtering the solution while hot. From this hot filtered solution it crystallizes as the fluid cools.

Chemists have obtained substances known as *cholesterilins* and *cholesterones* from the decomposition of cholesterine.

CHOLET, a t. of France, in the department of Maine-et-Loire, on the right bank of the Maine, 32 m. s.w. of Angers. Here, during the Vendean war, two actions were fought in 1793, in both of which the royalists were defeated. In the first, they lost their brave gen. Bonchamps; and the second drove them across the Loire, thus virtually deciding the war against them. It has manufactures of fine woolen and mixed fabrics, and leather, and a trade in cattle. Pop. '76, 12,335.

CHOLU'LA, a once flourishing, but now decayed, t. of Mexico, 60 m. to the e.s.e. of the capital, and 15 to the w.n.w. of La Puebla. Cortes found in it 20,000 houses, and as many more in the suburbs, and also 400 temples. Now the place contains only about 10,000 inhabitants. Its most remarkable memorial of aboriginal times is a pyramid of

clay and brick, surmounted on the top by a chapel of Spanish origin. Its height is 177 ft., while the side of its base measures 480 yards. C. stands on the table-land of Anahuac, at an elevation of 6,912 ft. above the level of the sea.

CHOMEL, Auguste François, 1788–1858; a French physician long employed in the Paris hospitals; author of *Essai sur les Rheumatismes; Éléments de Pathologie générale;* and *Traité des fièvres et des Maladies pestilentielles.* He was made professor of medicine at the faculty of Paris, as successor to Laennec. He had a more lucrative practice than any other physician in France.

CHONDA, a t. of Gwalior, 18 m. to the n.w. of the fort of the latter name, in lat. 26° 27′ n., and long. 78° east. It claims notice merely as the scene of a decisive victory gained by sir Hugh, afterwards lord Gough, over the Mahrattas, on 29th Dec., 1843.

CHON′DRINE. See Gelatine.

CHONDROPTERY′GII. See Cartilaginous Fishes.

CHO′NETES, a genus of fossil brachiopodous mollusca, nearly allied to the well-known genus *productus.* It is characterized by its transversely-oblong shell, and by having the long margin of the ventral valve armed with a series of tubular spines. Twenty-nine species have been described from the paleozoic formations.

CHO′NOS ARCHIPELAGO, a group of islands off the w. coast of Patagonia, lat 44° to 46° s., long. 74° to 75° west. With the exception of a few of the most westerly, all are bare and scantily peopled, though several are of considerable extent.

CHONS, or Khonsou, an Egyptian deity worshiped at Thebes as the great eldest son of Amen-Ra and Mut, and identified with the moon. The Greeks thought him to be a form of Hercules. Like Horus, he is represented as a youthful god, his form mummied, wearing the lock of hair at the right side of his head, and a skull-cap surmounted by the full and dichotomized lunar disk; or hawk-headed, wearing the same. He holds a crook and whip. He was a celestial deity, and at a later time connected with Thoth, and was said to have proceeded from Nu or Han, the celestial waters. A tablet found in a temple at Karnak which was dedicated to this god, records the departure of C. in his ark in the 16th year of the reign of Rameses XII. to the land of Baktan to expel a demon which had possessed the daughter of a king of that country and sister of the queen of Egypt. He succeeded, and returned in his ark 17 years later. The worship of C. appears to have been common in the Ptolemaic period, and figures of the god in porcelain and bronze are not uncommon. He represents the youngest, as Ammon did the oldest, of the divine circle.

CHONTA′LES, a district of Nicaragua, n.e. of lakes Nicaragua and Managua, traversed by the Cordilleras, along the slopes of which are valuable mines. There are a number of small towns peopled chiefly by native Indians. Some of the gold mines now worked by them were worked by the early Spanish adventurers. There is a bed of coal near lake Nicaragua. The grassy plains among the mountains support large herds of horses and cattle. Tropical fruits grow abundantly, and there is good timber in the neighborhood of the mines.

CHO′PIN (Scotch, *chappin*), the name of a Scotch liquid measure equivalent to the English quart.

CHOPIN, Frederic, a distinguished Polish pianist and musical composer. He was b. at Zelazowa-wola, near Warsaw, in 1810, and studied music at Warsaw under prof. Joseph Elsner. An exile after the revolution of 1830, he took up his residence in Paris, where he lived admired both professionally and in society. His health, always delicate, broke down in 1837, when he went for a time to Majorca, from which he afterwards returned, benefited by the change. After again suffering much from illness and depression of spirits, he visited England and Scotland in 1848, and in London was welcomed with enthusiasm in public and private. He never recovered from the fatigues of this journey, but died in Paris, 17th Oct., 1849, and was buried, by his desire, beside Bellini, in the cemetery of Père-la-Chaise. His compositions, restricted to pianoforte music, are in high esteem among musicians, and consist chiefly of preludes, notturnos, polonaises, mazurkas, and valses, with a few concertos and sonatas. They are pervaded by a sensitive, restless, and highly poetic fancy, and abound in subtle ideas, graceful and original harmonic effects, and rich ornamentation. The so-called polonaises, mazurkas, and valses are not dance music, but dreamy compositions suggestive of the rhythm and character of these dances, in which the peculiarities of Polish national music are blended with French elegance and taste.

CHOP′INE (Spanish, *chapin*), a high clog, or slipper, deriving its name, as is supposed, from the sound *chap, chop,* made by the wearers in walking. Chopines were of eastern origin, but were introduced into England from Venice during the reign of Elizabeth. They were worn by ladies under the shoes, and were usually made of wood covered with leather, often of various colors, and frequently painted and gilded. Some of them were as much as half a yard high; and in Venice, where they were usually worn, their height distinguished the quality of the lady. The C. is mentioned by Shakespeare in *Hamlet.*

CHOPPIN, Samuel Paul, M.D. See page 897.

CHOPTANK RIVER rises in Delaware, and flows s.w. through that state and Maryland, forming a wide estuary as it nears Chesapeake bay, into which it empties. It is navigable for small vessels for about 50 miles.

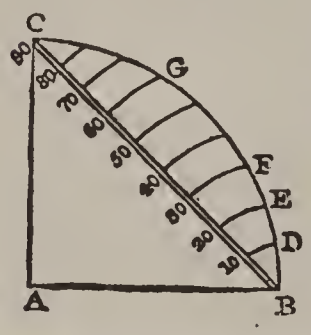
CHORA'GIC MONUMENTS. The choragus, or person at Athens who, on behalf of his tribe, had supported the chorus (q.v.), and who, in competition with the other tribes, had exhibited the best musical or theatrical performance, received a tripod for a prize; but he had the expense of consecrating it, and of building the monument on which it was placed. There was at Athens a whole street formed by these monuments, called the "street of the tripods." The figure represents the monument of Lysicrates, popularly known as the "lantern of Demosthenes."

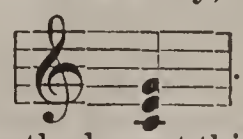
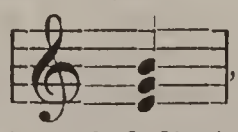
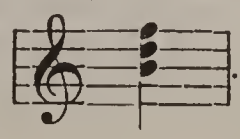
CHORALE', a musical term adopted from the German, means a melody to which sacred hymns or psalms are sung in public worship by the whole congregation in unison. The melody of the C. moves in notes of a slow and strictly measured progression, and of a solemn and dignified character that disposes the mind to devotion. Although the term C. is now always applied to the music of the Protestant church, it belonged to the Christian church at all times, as melodies still in use can be traced with certainty to have been sung by the congregations in the first centuries of Christianity. Among these is the song of praise by St. Ambrose, still retained in the Lutheran church, to the words "Herr, Gott, dich loben wir." The C. is intimately connected with the history of music, as vocal music was the only kind used in worship until far on in the middle ages. The C. is precisely what our psalm-tune is, or rather what it formerly was, and ought again to become. The pure, simple C. has, in a great degree, been cast aside in the British isles, and its place occupied by tunes of a comparatively puerile style, which are frequently only adaptations of operatic songs and other profane pieces.

CHORAL MUSIC, the ancient music of the church. Music in parts for different voices. See SACRED MUSIC.

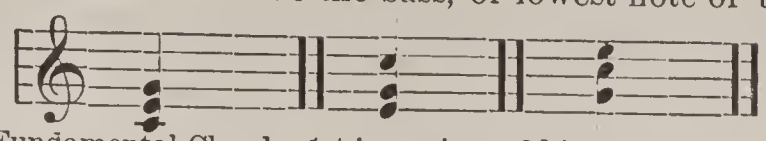
CHORAL SERVICE, the musical service of the English church, celebrated by a full complement of clergymen and choristers in a cathedral church, and when all those parts of the servic are sung as ordered in the rubrics.

CHORD. The C. of an arc of a curve is a straight line joining its two extremities. A SCALE OF CHORDS is used in laying off angles. It is thus constructed: Let AB be the radius of the circle to which the scale is to be adapted. With center A and radius AB describe a quadrant BEC. Divide the quadrantal arc BEC into nine equal parts BD, DE, etc. This may be done by taking a radius equal to AB, and from the centers B and C cutting the arc in G and F. As the radius is always equal to the chord of 60° or $\frac{2}{3}$ of a quadrant, the arc CB is thus divided into three equal parts, BF, FG, GC, and each of these parts may then be trisected by trial, as no direct method is known. Draw the chord of the quadrant BC; from B as a center, and the chord of BD as a radius, describe an arc cutting BC at 10; with the chord of BE as a radius, describe an arc cutting BC in 20; with the chord of BF, describe an arc cutting BC in 30; and in a similar manner, find the divisions 40, 50, 60, 70, 80. Then the arcs BD, BE, BF, being arcs of 10°, 20°, 30°, etc., respectively, the distances from B to 10, 20, 30, etc., are the chords of arcs of 10°, 20°, 30°, etc.; so that BC is a scale of chords for every 10°, from 0° to 90°. To lay down or measure angles with such a scale, the arc of measurement must be described with the chord of 60°.



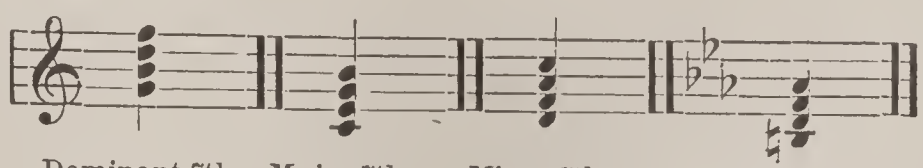
CHORD, in music, is the simultaneous and harmonious union of different sounds, at first intuitively recognized by the ear, and afterwards reduced to a science by the invention of the laws or rules of harmony. See HARMONY. Chords may consist of from two to five parts. Absolute chords of two parts are produced only by thirds or sevenths. Chords of more than two parts are either fundamental chords or inversions of them, and are divided into concords and discords. The union of sounds in all chords will be found, on analyzing their component parts, to be an admixture of major and minor thirds. The common chord, or *trias harmonica perfecta*, is the basis of all harmony, and consists of a bass note, or prime, with its third and fifth above, thus:  . These three sounds are at the distance of a third from each other. When the lowest third is the greater third, as above, the C. is a major chord; but when the lowest third is the lesser, thus:  , the C. is called a minor chord. A chord of two minor thirds combined is called diminished, as the interval from the lowest note to the highest is less than a perfect fifth, thus:  . The common C. admits of two inversions, accord-

ing as one or other of its notes is made the bass, or lowest note of the C., thus:



Fundamental Chord. 1st inversion. 2d inversion.

By adding another third above the common C., a C. of four parts is produced, which is called the chord of the seventh, because the highest note is a seventh above the bass. When the C. of the seventh is produced on the fifth of the scale, it is then called the dominant seventh, which is the most perfect species of the C. It then consists of a major third, perfect fifth, and seventh, the minor, which is the next harmonic produced by nature above the fifth. The C. of the seventh may also be formed on any of the notes of the major or minor scale taken as a bass note, which produces the varieties of major, minor, and diminished sevenths, thus:



Dominant 7th. Major 7th. Minor 7th. Diminished 7th.

The C. of the seventh admits of three inversions, according as the notes above the fundamental note are used as bass notes. From its nature, it requires a resolution, and is therefore always followed by a common C. whose fundamental bass is a fifth below that of the seventh. For the C. of the ninth, see HARMONY. The first proper arranged system of chords is by Rameau, in 1720, which has from time to time been extended and improved by Marpurg, Kirenberger, G. Weber, F. Schneider, Marx, and the late professor S. W. Dehn of Berlin.

CHORE'A (Gr. *choreia*, a dancing or jumping), a disease popularly called St. Vitus's dance, and consisting of a tendency to involuntary and irregular muscular contractions of the limbs and face, the mind and the functions of the brain generally being quite unaffected. The spasms of C. differ from those of most other convulsive affections in being unaccompanied either by pain or by rigidity; being, in fact, momentary jerking movements, indicating rather a want of control of the will over the muscles, than any real excess of their contractions. In some cases, the disease resembles merely an exaggeration of the restlessness and "fidgetiness" common among children; in others, it goes so far as to be a very serious malady, and may even threaten life. Fatal cases, however, are fortunately very rare, and in the large majority of instances the disease yields readily to treatment carefully pursued, or disappears spontaneously as the patient grows up. C. is a disease much more common among children of 6 years old, and upwards, than at any other period of life; it is also more common among female children than among males. The treatment generally pursued is the use of metallic tonics, such as zinc, copper, iron, and arsenic (the last, perhaps, the best), sometimes preceded or accompanied by purgatives. Exercise in the open air is also to be recommended; and gymnastics afford material aid in the cure. It is to be observed that the name St. Vitus's dance (dance of St. Weit) was applied originally in Germany to a different form of disease from that above referred to—one closely approaching in its characters the epidemic "dancing mania," which, in Italy, was called tarantism (q.v.).

CHOREPIS'COPI, an order of ministers of ancient origin, whose functions were to assist city bishops in rural districts or remote places. They acted in a subordinate capacity, and possessed limited powers, acting as colleagues or vicars of the bishops. They possessed the privilege of attending councils in their own right, and not merely as substitutes for bishops. At first they were confined to the eastern church, but began to multiply in the western church in the 5th century. They were succeeded after the 10th c. by archdeacons, vicars-general, and rural deans. In the east the order was abolished by the council of Rodicea about 365 A.D.

CHORLEY, a t. in Lancashire, on a hill on the Chor, 9 m. s.s.e. of Preston. It has an ancient parish church, supposed to be of Norman origin, and manufactures of cotton-yarn, jaconets, muslins, fancy goods, calicoes, and ginghams. In the vicinity are several coal-mines, a lead-mine, besides mines and quarries of iron, alum, slates, millstones, etc. Pop. '81, 19,472.

CHORLEY, HENRY FOTHERGILL, 1808–72; an English author who paid much attention to musical criticism. After long effort he got a position on the London *Athenæum*, and for 35 years conducted the musical department of that journal. He wrote on other subjects besides music, producing the librettos of the *Amber Witch;* the *May Queen; St. Cecilia; Kenilworth; The Sapphire Necklace;* and *Faust.* Other of his works are. *Conti the Discarded, and Other Tales; Sketches of a Seaport Town; Memorials of Mrs. Hemans; Lion, a Tale of the Coteries; Music and Manners in France and Germany; Pomfret; Criticisms on Modern German Music;* and *Thirty Years' Musical Recollections.*

CHOROID COAT See EYE, *ante.*

CHO'RUS, among the ancients, meant a band of singers and dancers employed on festive occasions of great pomp, and also in the performance of tragedy and comedy

on the stage. In the time of the Attic tragedy, the C. consisted of a group of persons, male and female, who remained on the stage during the whole performance as spectators, or rather as witnesses. When a pause took place in the acting, the C. either sang or spoke verses having reference to the subject represented, which served to increase the impression or sensation produced by the performers. At times, the C. seemed to take part with or against the persons in the drama, by advice, comfort, exhortation, or dissuasion. In early times, the C. was very large, sometimes consisting of upwards of fifty persons, but afterwards it was much reduced. Its leader was termed the coryphæus. The charge of organizing it was considered a great honor among the citizens of Athens. The person appointed for this purpose was called the *choragus*. The honor was very expensive, as the choragus had to pay all the expenses incurred in training the members of the C. to perform their parts efficiently. They were, besides, fed and lodged by him during training-time, and he had also to provide for them masks and dresses. At times, the C. was divided, and spoke or sang antiphonally. These divisions moved from side to side of the stage, from which movement originated the naming of the single songs or stanzas, such as strophe, antistrophe, and epode. How the musical element of the ancient C. was constituted or composed, is not known with any certainty. Possibly, it was only a kind of rhythmical declamation, and doubtless very simple. It was accompanied by flutes in unison. With the decline of the ancient tragedy, the C. also fell into disuse; and only lately has there been an attempt to produce the same on the stage in the manner of the ancients, as, for example, in Schiller's *Bride of Messina*. The music which has been set in modern times to some of the Greek tragedies, does not give the least idea of the original music.

In modern times, by C. is understood the union of singers or musicians for the joint performance of a musical work C. is also the name given to a musical composition for numerous voices, either with or without accompaniment, and intended to express the united feelings of a multitude. The musical C. is the only artistic means by which a simultaneous movement or sentiment of a multitude can be represented in the drama, the language or text being always of a simple rhythm, permitting only of a limited movement suited to the combination of a multitude. It is, however, not always necessary that every part of the C. should manifest the same feeling or sentiment. Two or more parts of the C. may act against each other, as suits the purport of the drama. Double, triple, and quadruple choruses are found in the old Italian compositions for the church. In modern times, the C. is much used, and with great effect, in operas, especially those of Meyerbeer and Wagner. In oratorio, the C. is of the greatest importance, and the numbers now employed to sing the C. far exceed anything attempted a century ago; but this is not always an advantage, for the *tempi* must necessarily be taken much more slowly, which has a sluggish effect; while increase in the number of voices does not always produce a greater power of sound. The C. of 35 well-trained voices from the pope's chapel, who sang at the coronation of Napoleon I., in the cathedral of Notre Dame, Paris, produced a far greater and more wonderful effect when they entered singing the *Tu es Petrus*, than another C. of hundreds of voices, and 80 harps, that had been assembled and trained for the same occasion, in expectation of surpassing all that man could imagine. The greater the number, the greater is the difficulty in obtaining unity.—C., in organ-building, is the name given to stops of the mixture species, some of which contain 2, 3, 4, 5, 6, or more pipes to each note, tuned at consonant intervals in relation to the fundamental stops.

***CHOSE IN ACTION**, in the law of England, is that kind of property which consists not in possession, but in the legal right to possess. As this right can, in general, be vindicated and made available only by means of an action, the property to which it relates, whether real or personal, is called a thing (*res* or *chose*) in action, to distinguish it from a thing already in possession. Money due upon bonds and bills, goods bought and not yet delivered, are examples of choses in action, as is also the right to compensation for damage occasioned by breach of contract. "By the strict rule of the ancient common law, no chose of action could be assigned or granted over, because it was thought to be a great encouragement to litigiousness, if a man were allowed to make over to a stranger his right of going to law. [See CHAMPERTY.] But this nicety is now not so far regarded as to render such a transaction really ineffectual. It is, on the contrary, in substance, a valid and constant practice; though, in compliance with the ancient principle, the form of assigning a chose in action is in the nature of a declaration of trust, and an agreement to permit the assignee to make use of the name of the assigner, in order to recover possession. . . . The king is an exception to this general rule, for he might always either grant or receive a chose in action by assignment; and our courts of *equity*, making the rule itself give way to the expediency, in a commercial point of view, of facilitating the transfer of property, allow the assignment of a chose in action as freely and directly as the *law* does that of a chose in possession."—Stephen's *Commentaries*, ii. p. 45. One would imagine that the more convenient and philosophical arrangement would be, by the interposition of the legislature, to make law conform at once to equity and expediency. See *Supp.*, page 897.

CHOSROES. See KHOSRU, *ante*.

CHO'TA NAGPORE', or NAGPORE THE LESS, one of the lower provinces of Bengal, containing 5 British collectorates, besides 7 tributary minor states. The area of the British divisions is 28,482 sq.m., and in 1871 the pop. was 3,419,591, consisting chiefly of aboriginal tribes who are little removed from barbarians. The country is for the most part wild and hilly, consisting of an undulating plateau 3,000 ft. above the sea. Its chief products are coal, jute, tea, and indigo; iron is also found. From the elevation of the tract, the temperature varies considerably, ranging in winter from 32° to 62°, and in summer from 78° to 98°.

CHOTEAU, a co. in Montana, on the Canadian border, near the head waters of the Missouri river, drained by the Missouri, the Dog, Milk, Arrow, Teton, Judith, Bear, and other rivers; about 12,500 sq.m.; pop. '80, 3058, besides Indians. Co. seat, Fort Benton.

CHOTYN, KHOTIN, or CHOCZIN, a t. in Bessarabia, on the river Dneister, 45 m. s.w. of Kamieniec; pop. '67, 20,917. It is a fortified military post, and once belonged to the Turks, but was taken by the Russians in 1739.

CHOUANS were bands of insurgent royalists, who, during the French revolution, organized a reactionary movement in Brittany. They obtained their name from their leader, Jean Cottereau. This person, who had been a smuggler, went by the name of Chouan—a corruption, it is said, of *chat-huant* ("screech-owl")—because, while he and his accomplices were engaged in their nocturnal work, they were wont to be warned of their danger by some one on the watch imitating the cry of this bird. At the period of the revolt, however, he followed the humble occupation of a clog-maker. The first indications of an anti-revolutionary spirit in Brittany manifested themselves in the beginning of 1791, when several trees of liberty were destroyed at night, and other more serious outrages committed. These disturbances were fomented by seditious priests. In 1792, and insurrection was planned by the marquis de la Rouarie, with the sanction and approval of the two brothers of Louis XVI. The agents of the marquis entered into communications with Jean Cottereau—well known for the reckless audacity of his character—and other smugglers; but having the misfortune to be arrested, the carrying out of the insurrection devolved upon the latter. The *Chouanerie*, as the insurrection was called, at first digraced itself, both by the drunken license and the cruelty which marked it. After several successful exploits of the guerrilla sort, Jean Cottereau perished in an engagement which took place on the 28th July, 1794, near the wood of Misdon, the theater of his first efforts. Before this, however, other and more illustrious leaders had appeared in Brittany to direct the movement, the chief of whom were Georges Cadoudal (q.v.) and Charette. Through their endeavors it was more widely extended, and for a time seemed likely to imperil the security of France, but was suppressed towards the close of 1799. Petty *spurts* of insurrection, however, broke out till about 1803, when the *Chouanerie* ceased for awhile. In 1814–15, it again made its appearance on both sides of the Loire; and after the July revolution, was once more excited by the duchess of Berry on behalf of the duke of Bordeaux, but crushed by the energetic measures taken by M. Thiers.

CHOUGH, *Fregilus*, a genus of birds of the crow family (*corvidæ*), but approaching to the characters and appearance of the starlings (*sturnidæ*). The length of the bill has induced some naturalists, among whom was Cuvier, to place them beside the hoopoes' but this is now generally regarded as an error; they agree with crows in having their nostrils covered with stiff bristles directed forward, and in their habits. The beak is longer than the head, strong, arched, and pointed. The tail is slightly rounded. The only European species is the common C., sometimes called the Cornish C., or red-legged crow (*F. graculus*), a widely distributed but very local bird, inhabiting the Swiss Alps, the high mountains of Spain, of Greece, of India, and of Persia, the s. of Siberia, the n. of Africa, and some parts of the British sea-coasts; but almost exclusively confined to situations where there are high cliffs. In these it generally makes its nest; sometimes, however, in ruined towers. Its long hooked claws enable it to cling easily to a rough rock, but it seems unwilling even to set its feet on turf. It lives in societies like the rook. It feeds on insects, berries, grubs, and grain. It is easily tamed, becomes very familiar and forward, and exhibits in the highest degree the curiosity, the pilfering disposition, and the delight in brilliant or glittering objects, which also characterize others of the crow family.—Other species of C. are known, natives of Australia, Java, etc. Some naturalists unite the chocards and the choughs into one genus.

CHOULES, JOHN OVERTON, D.D., 1801–56; a native of England, who emigrated to the United States in 1824. In 1827, he became minister of the Second Baptist church in Newport, R. I. Six years later, he went to New Bedford; in 1837, to Buffalo; in 1841, to the Sixth street Baptist church in New York; and in 1843, to the church at Jamaica Plain, near Boston. In 1847, he returned to his Newport church; and in 1854, accompanied commodore Vanderbilt in his yacht voyage to Europe. Among his publications are *Young Americans Abroad*, and *The Cruise of the North Star* (the commodore's yacht). He also contributed to and edited several historical works.

CHOUTEAU, AUGUSTE, 1739–1829; a native of New Orleans, and a pioneer in north-western settlements. With his brother Pièrre he was the founder of the present city of St. Louis.

CHOUTEAU, Pièrre, 1749–1849; brother of Auguste, and with him the founder of St. Louis, where they settled in 1764. The two were members of an expedition under Laclede, sent by the French government of Louisiana to open trade in the region of the Missouri and upper Mississippi. The brothers remained in St. Louis all their lives, Auguste reaching 90 and Pièrre 100 years of age. They were the heads of large families of high standing and great wealth and influence in Missouri and adjoining states.

CHOUTEAU, Pièrre, 1789–1865; son of Pièrre the founder of St. Louis. He was all his life engaged in the fur trade, following the Indian tribes as they retired before white encroachment, and establishing trading-posts in many remote points. In 1834, he and his associates bought the fur-trade interests of John Jacob Astor, and extended their operations over all the regions e. of the Rocky mountains down to Mexico. Chouteau was a member of the convention that framed the first constitution of Missouri.

CHOWAN, a co. in n.e. North Carolina, on Albemarle sound, and bounded w. by Chowan river; 240 sq.m.; pop. '80, 7900—4267 colored. The surface is uneven, and the soil fertile, producing corn, cotton, etc. Co. seat, Edenton.

CHOYA. See Chay Root.

CHRESTIEN, or CHRÉTIEN, DE TROYES, an early writer of French romance, of whose life little is known, except that he was b. at Troyes in the 11th century. It is supposed that he was attached to the court of Philip of Alsace, count of Flanders. The six romances that critics concede to be of his composition are: *Irec et Enide*, from which Tennyson took one of his Arthurian legends; *Cliges* or *Cliget*, a second round-table romance; *Le Chevalier au Lion; Guillaume d'Angleterre; Le Chevalier de la Charette;* and *Perceval le Gallois.* He also wrote *Tristan, ou le Roi Marc et le Reine Yseult*, and *Le Chevalier de l'Épée*, but these two works are lost.

CHRESTIEN, Florent, 1541–96; a Latin poet, at an early age tutor to Henry of Navarre, afterwards Henry IV., who made him his librarian. Chrestien was the author of many translations from Greek into Latin verse, and also of translations into French. He wrote in verse against Pibrach, the apologist of the massacre of St. Bartholomew; but his claim to a place among satirical writers rests upon his share in the *Satyre Menippée*, a pasquinade in the interest of Henry IV.

CHRESTOM'ATHY, a collection of extracts, or text books, useful in learning a language, or in gaining special information.

CHRISM (Gr. *chrisma*, ointment) is the name given to the oil consecrated on holy Thursday, in the Roman Catholic and Greek churches, by the bishop, and used in baptism, confirmation, orders, and extreme unction. There are two kinds of C.—the one, a mixture of oil and balsam, is used in baptism, confirmation, and orders; the other, which is merely plain oil, is used in extreme unction.

CHRI'SOME, the name of the white vesture laid by the priest on the child in former times at baptism, to signify its innocence. It was generally presented by the mother as an offering to the church, but if the child died before the mother was "churched" again, it was used as a shroud. By a common abuse of words, C. came to be applied to the child itself. A C. child is a child in a C. cloth. As late as Jeremy Taylor (*Holy Dying*, c. i., s. 2), we have the following: "Every morning creeps out of a dark cloud, leaving behind it an ignorance and silence deep as midnight, and undiscerned as are the phantasms that make a chrisome child to smile."

CHRIST, a title of our Saviour (see Jesus), now in general use almost as a name or as part of his name. It is originally Greek, signifies *anointed,* and corresponds exactly in meaning and use with the Hebrew word Messiah (q.v.); so that this title given to Jesus of Nazareth, is an acknowledgment of him as the Saviour long promised to the house of Jacob and to the human race. As prophets, priests, and kings were anointed on being called to their several offices (I Kings i. 34, 39; I Sam. xvi. 13; Exod. xxix. 7), so the Saviour was anointed as at once prophet, priest, and king; the Holy Spirit, often represented under this figure, being given to him to qualify his human nature for all that belonged to his mediatorial office and work.

The whole system of Christianity depends on the doctrine of the Person of Christ. An essential difference necessarily exists on almost every point between the systems of doctrine maintained by those who do and by those who do not acknowledge a union of the divine and human natures in his person. Some of the early heretics maintained an opinion, which has long ceased to have any supporters, that the body of C. was not a real body, but a mere visionary appearance. See Docetæ and Gnostics. The opposite extreme is that of Socinians, by whom C. is regarded as a mere man; whilst Arians (q.v.) regard him as in his *pre-existence*—i.e., before his *incarnation*—the highest of all created beings; and according to the generally received doctrine of Christians, he is "God and man in two distinct natures and one person." This doctrine, of course, bears a most intimate relation to that of the Trinity (q.v.); and all who hold the divinity of Jesus Christ, regard him as the incarnate second person of the godhead. The proof of the whole doctrine may almost be said to consist simply in a proof of the *divinity* of C.; his real *humanity,* although equally important, being no longer disputed. And this

proof is found, not so much in particular texts which directly assert the divinity of C.—although such texts are important—as in the multitude of texts which imply it, and admit of no reasonable or natural explanation apart from it; and in showing that certain doctrines are taught in Scripture which cannot be maintained without this.

The ancient Apollinarians, Eutychians, Monophysites, etc., regarded C. as having only one nature—a *compound* of the divine and human; but such a notion as that C. had only a human body, the divine nature supplying the place of a soul, is held to be subversive of the whole Christian system; and his human nature, to be real, must be viewed as consisting both of a true body and a true soul. His human nature never existed, however, apart from his divine nature, and was "conceived by the power of the Holy Ghost."

Closely connected with this subject is that of the *humiliation* and consequent *exaltation* of C., in his character of mediator between God and man; a subject, to the former branch of which belongs the whole doctrine of the *work* of C. for the redemption of sinners, including the great doctrine of atonement (q.v.). To the latter belongs the doctrine of the reward of his work, in his sitting at the right hand of God, and having all things put under his feet; not only exercising dominion as king in his church, but over all things for the advancement of the salvation of his church, and of every member of it; while also he sends forth the Holy Spirit to apply to men the blessings which, as the reward of his work, he has mediatorially obtained for them; and still continuing to act as a priest, makes continual intercession (q.v.), founded upon his work and sacrifice.

CHRIST, Order of, in Portugal. When the Templars were expelled from France, and their property confiscated by Philippe le bel, with the sanction of pope Clement V., they were received into Portugal, and their order revived in 1317, under the title of "The Order of our Lord Jesus Christ." With some difficulty, pope John XXII. was induced to sanction the new order. The knights of the order of Christ joined the Portuguese in all their crusades against the infidel, and also in their African and Indian expeditions, receiving in compensation continual additions to their own possessions. The grand prior of the order was invested by pope Calixtus III. with power equal to that of a bishop; and as an encouragement to adventure, the knights were promised all the countries which they might discover, to be held under the protection of Portugal. At length, their wealth and power excited the jealousy of the kings of Portugal; their future acquisitions, and, subsequently, even their actual possessions, were declared to be crown possessions, and the offices of administrator and grand-master were transferred to the crown. A fine cloister belonging to the order is still to be seen at Tomar, to which place the seat of the order was transferred from Castro-Marino in 1366. Noble descent, and three years' military service against the infidel, were required for admission. The members took the three monkish vows of chastity, poverty, and obedience, till the pope released them from the first two, on condition of their applying the third part of their revenues to the support of Tomar cloister, the priests of which were bound by the three vows. This cloister is now a theological institution for the instruction of the priests of the order.

It is said that the order still possesses 26 villages and farms, and 434 prebends. It is very numerous—consisting of 6 knights of the grand cross, 450 commanders, and an unlimited number of knights. Catholics of noble descent alone are admitted, and foreigners are excluded from participation in the revenues, being exempted in return from its rules.

CHRIST, Papal Order of. This is a branch of the Portuguese order, created by pope John XXII. It has only one class.

CHRIST, Pictures of. To represent the form and countenance of C. in a manner that shall even approximate to the latent ideal in the minds of men, is unquestionably the most sublime and the most difficult work which an artist can undertake. It is the highest pictorial effort of the creative faculty. From a very early period in the history of the church, we can trace the growth of the endeavor. At first, indeed, the horror entertained for the idols of the pagans, must have inspired Christians with an aversion to images or pictures of the Savior. Gradually, however, as paganism disappeared, and time removed C. further from his people, this feeling would subside, and the longing would arise to possess some representation of him on which the eye might rest with pious delight. When Christian art originated we cannot precisely say; it is usually dated from the time of Constantine. Nevertheless—as lord Lindsay remarks, in his *Sketches of the History of Christian Art* (Lond. 1847)—"it would be more correct to say that it then first emerged above ground; its earliest efforts must be sought for in the catacombs." In these subterranean excavations, forming a maze of unknown extent and labyrinthine intricacy, to which the Roman Christians had recourse in the days of persecution, are to be found the first traces of Christian sculpture and painting. The *sarcophagi* of the martyrs and confessors, of the heroes and heroines, of the bishops, and, in general, of those of higher mark and renown, were painted over with the symbols and devices of Christianity. The parables were the chief source from which these sepulchral artists drew their symbols. C. is painted as the good shepherd in the midst of his flock, or, with "pastoral pipe," seeking the lost sheep, or returning with it on his

shoulders. Sometimes he figures as an ideal youth in the bloom of his years, sometimes as a bearded man in the prime of life, sometimes as Orpheus surrounded by wild beasts enrapt by the melody of his lyre. Such pictures, however, were only *symbolical*, and did not satisfy the religious craving for a *portrait*. The age of Constantine marks the transition from the symbolical to the *pseudo-historical* picture. We now find C. represented in the midst of his disciples, or in the act of performing a miracle; but it is not till about the close of the 4th c. that we actually encounter that type of countenance which, which certain modifications, continued to rule the conceptions of artists during the whole of the middle ages. To vindicate this type, myths, at a later period, sprang into existence; and we read of a portrait of C. possessed by king Abgarus of Edessa, and imprinted on a handkerchief, and of another miraculously obtained by St. Veronica at the crucifixion; but there is as little foundation for these legends as for that which attributes to the evangelist Luke such a picture. The emperor Alexander Severus (230 A.D.) is said to have possessed in his palace an image of Christ. An antique mosaic, probably of the 3d c., which exists in the *Museo Christiano* of the Vatican—where are to be found also some specimens of the frescos of the catacombs—gives an idea of the manner in which the heathen artists expressed their notion of Christ. He is depicted as a bearded philosopher in profile. A letter which Lentulus, the predecessor of Pilate, is declared to have written to the Roman senate, but which is evidently apocryphal, attributes to C. a figure and countenance of manly beauty. Towards the middle of the 8th c., John of Damascus gives a description which he pretends to have gathered from more ancient authors. According to him, C. was tall, had beautiful eyes, but the eyebrows meeting; a regular nose, flowing locks, a black beard, and a sandy or straw-colored complexion, like his mother. Among the most ancient representations of C. which profess to be portraits, are the two paintings in the Calixtine and Pontine catacombs near Rome, and which are given in Arighi's *Roma Subterranea Nova*. The Savior is there represented with an oval visage, a straight nose, arched eyebrows, and high forehead. The expression is earnest and mild; the hair is parted on the forehead, and falls over the shoulders in waving locks; the beard is short and scattered. These two busts agree with the apocryphal letter of Lentulus, and the artist or artists who executed them, may possibly have employed it as a model. The majority of the Byzantine and Italian painters, down to the age of Michael Angelo and Raphael, adhered to this type.

CHRIST or CRIS CROSS **ROW**, the alphabet arranged in the form of a cross, for the use of children; and so printed, in old "horn" books, or primers. The letter A was at the top, and Z at the foot of the cross.

CHRISTADEL'PHIANS, a recently organized religious sect in America, whose principles are thus stated: The Old and New Testaments are equally important; God will restore to immortal life all who love him in this life, but those who have not accepted this immortal principle cease to exist at death; there is no personal devil; Christ is the son of God, deriving from the Deity moral perfection, but from his mother a human nature; he has the three-fold character of prophet, priest, and king; the first office he fulfilled by his life and death on earth, and now as priest he mediates before the deity; as king he will return to earth and reign over all the world from the throne of David. The adherents of this sect are few.

CHRISTCHURCH, a parliamentary and municipal borough and seaport on the English channel, in Hampshire, at the head of the estuary formed by the Avon and Stour, 24 m. s.w. of Southamptom. It has manufactures of fusee chains for clocks and watches, and of hosiery. It has also a salmon-fishery. The priory church, one of the most interesting and magnificent of English ecclesiastical structures, dates from the reign of William Rufus, and was restored in 1861. A battery of artillery is generally stationed in the commodious barracks. The borough comprises two favorite watering-places, Mudeford and Bournemouth. There are traces here of a Roman temple to Mars. Pop. '81, 28,537. It returns one member to parliament.—C. bay has a double tide every 12 hours.

CHRISTCHURCH, capital of the province of Canterbury, in New Zealand, situated on the river Avon, about 8 m. from the sea. Its port is Littleton, with which it is connected by a railway, and it is in railway communication with the n. and south. It is the center of a great grazing district, and has also flourishing manufactories. There is a large export trade, chiefly in timber and wool. The city possesses numerous fine public buildings, churches, theater, etc. Pop. '75, 10,294; of electoral district, 13,000.

CHRIST-CHURCH, THE CATHEDRAL OF (Oxford). This great society has had three distinct foundations. In 1526, cardinal Wolsey obtained from Clement VII. a bull for the suppression of 22 monasteries, the site of one of which he selected as the site of a new college, to be called cardinal college, and which he intended to endow on a scale of magnificence beyond that of any other foundation in Oxford. On the fall of Wolsey in 1529, the whole establishment came into the hands of king Henry VIII. In 1532, that prince refounded it under the name of king Henry VIII.'s college, and in 1546. he once more re-established the college, under the name of "Christ-church cathedral in Oxford, or the foundation of king Henry VIII., with a dean and 8 canons, 60 students, 40 schoolboys, clerks, choristers," etc. This foundation is now subsisting, though it has under-

gone considerable modifications. To none of the canonries were any duties assigned by king Henry VIII. From time to time, however, the canonries have been annexed to various university professorships, more particularly one to the professorship of divinity, by king James I.; one to the professorship of Hebrew, by king Charles I., and one to the professorships of ecclesiastical history and pastoral theology respectively, by queen Victoria.

Several changes were introduced by the commissioners appointed under 17 and 18 Vict. c. 81. There is now only one sinecure-enjoying canon. When he is off the list, no one may hold a canonry save a professor, the archdeacon, or the sub-dean. The studentships are now 80 in number, and are, as before, divided into junior and senior studentships, differing considerable as to emolument. All these are now open, the old system of appointment by nomination having been abolished. About three junior students are elected every year in Lent term, one in every three for excellence in mathematics or physical science; and besides these, three are sent up yearly from Westminster. The senior studentships are also open, with the usual limitation of independent income. Of these, however, only a third can be held by laymen. The studentships were very poor; but an improvement in this respect has been included among the recent changes. Some valuable exhibitions, however, and 90 benefices, are in the gift of the society. In 1875, there were about 1150 names on the college books. No statutes were given to C., owing to the death of the king having taken place shortly after the final foundation of the college. It was, in consequence, entirely governed by the orders of the dean and chapter, to the total exclusion of the tutors. To this separation of the governing from the teaching body, as well as to the small value of the studentships, may be ascribed, in great measure, the inconsiderable degree of success in the schools, which, for many years past, brought no small discredit on this magnificent society.

CHRISTENING, a term often used as equivalent to baptism (q.v.). It is disliked by some, and of course liked by others, as favoring the doctrine of baptismal regeneration; being, indeed, according to its derivation, expressive of the notion that a person is *made a Christian* in baptism. But, like many other terms, it is frequently employed without reference to its origin, and without any intention of conveying the opinion which it might be strictly held to imply.

CHRISTIAN, a co. in central Illinois, traversed by the Illinois Central, the Indianapolis and St. Louis, the Springfield and Illinois South-eastern, and the St. Louis division of the Toledo, Wabash, and Western railroads; 675 sq.m.; pop. '80, 28,232. It is generally level timber-land and prairie; productions agricultural. Co. seat, Taylorsville.

CHRISTIAN, a co. in s.w. Kentucky, on the Tennessee border, intersected by the Evansville, Henderson and Nashville railroad; 704 sq.m.; pop. '80, 31,861—14,639 colored. It is hilly in the n., but level in the s., with productive soil; the products are wheat, corn, hay, butter, wool, and tobacco. Co. seat, Hopkinsville.

CHRISTIAN, a co. in s.w. Missouri, drained by James river, and intersected by the Atlantic and Pacific railroad; 500 sq.m.; pop. '80, 9649—197 colored. The surface is hilly, and the soil in the valleys is rich, producing wheat, corn, tobacco, etc. Timber abounds. Co. seat, Ozark.

CHRISTIAN II., King of Denmark, Norway, and Sweden, b. at Vyborg, in the island of Funen, 2d July, 1481. He ascended the throne of Denmark in 1513. Shortly after his marriage in 1515, with a sister of the emperor Charles V., a young Norwegian peasant-girl, with whom C. was in love, died, or, as it was believed, was murdered. That natural ferocity, for which C. was surnamed the *Angry*, burst forth most furiously on this occasion. He caused the governor of the castle, Torben Oxe (see DYVEKÉ), to be beheaded. He afterwards declared open war against Sweden, took Stockholm through fraud, and had himself crowned king. But the cruel vengeance and treachery of C. after this event excited the indignation of that country, which, headed by Gustavus Wasa (q.v.), succeeded in driving out the Danes, liberating itself from the yoke of the house of Kalmar, and finally electing Gustavus Wasa (in 1523) to the throne. In Denmark, too, the aristocracy had risen, and an insurrection in Jütland following, C. found himself forced to flee for refuge to the Netherlands, and his uncle Frederick I. (q.v.), the introducer of the reformation into Denmark, elected king in his place. Encouraged, however, by the Catholic party in the Netherlands, and assisted by Charles V., C. landed successfully in Norway in 1531; but at the battle of Aggerhuus in 1532, he was totally defeated, and made prisoner in the castle at Sonderburg, from which he was liberated after 12 years of confinement. He died 28th Jan., 1559.

CHRISTIAN IV., King of Denmark and Norway, and duke of Schleswig-Holstein, b. in Zealand, 12th April, 1577, and elected successor to the throne in 1580. He assumed the scepter in 1593. From 1610 he carried on a successful war, known as the Kalmarian war, against Charles IX. of Sweden, and his successor, Gustavus Adolphus, which ended in an advantageous peace in 1613. As leader of the Protestants in the thirty years' war, C. was not successful. His labors for the improvement of his country, in which he was indefatigable, were, however, most beneficial. He strengthened its maritime power; extended its commerce as far as the East Indies, where he obtained

inland trade of the country. His legislative and financial reforms, together with his love and patronage of the arts and sciences, gained for him the esteem of his people, especially of the learned. He died in 1648.

CHRISTIAN VII., King of Denmark, son of Frederick V. and Louisa of England, b. 29th Jan., 1749. He succeeded to the throne of his father 14th Jan., 1766, and in the same year married Caroline Matilda, sister of George III. of England. The dissipations of his early life had enfeebled his energies, and rendered him unfit for government. The management of the state was, in consequence, seized by his ministers, with count Bernstorff, who had possessed the entire confidence of the king's father, at their head. Bernstorff, however, was soon forced to retreat before Struensee (q.v.), who exercised unbounded influence over the king and his imprudent young queen. But innovations of a despotic tendency, and insults offered to the national feeling, soon drew upon this minister the hatred of the nation. The queen-dowager seeing this, made it an occasion for satisfying her ambitious nature, by attaching herself to the malcontents; and in 1772 she succeeded, with the assistance of her son, Frederick (b. 1754, d. 1805), in persuading the vacillating king to draw up an order of arrest for Struensee and the young queen. Bernstorff was recalled from Hamburg. The king, who was now incapacitated by mental disease, governed only nominally. In 1784, his son, Frederick VI. (q.v.), came to the head of the government, as joint regent with the queen-mother. C. died 13th Mar., 1808.

CHRISTIAN VIII., 1786–1848; king of Denmark, nephew of Christian VII. When Norway was ceded to Sweden by the treaty of Kiel, the people of the former country repudiated the transfer, and C. was then made governor, raised an army and convened a diet, at which a constitution was framed, and he was elected, May 29, 1814, king of Norway under the title of Christian I., but the allied powers compelled him to relinquish the throne on the 10th of Oct. On the death of Frederick VI., Dec. 3, 1839, he became king of Denmark. He tried to unite Schleswig and a part of Holstein to Denmark, but did not succeed. He died just before the beginning of the revolution of 1848.

CHRISTIAN BURIAL. See Burial and Felo de se.

CHRISTIAN CHARITY, Knights of the Order of, in France. King Henry III. having instituted the order of the Holy Ghost for princes and persons of distinction, founded the order of C. C. for the support of maimed officers and soldiers, who had done good service in the wars. He assigned revenues to the order, drawn from all the hospitals in the kingdom. The knights wore on the left breast an anchored cross embroidered on white taffety or satin, with a border of blue silk, and in the middle of the cross a lozenge of sky blue charged with a *fleur de lis or*. The completion of the institution was reserved for Henry IV., who placed it under the charge of the marshals and colonels of France; and by means of it, many of those who had served their country faithfully were enabled to spend the latter portion of their lives in peace, and above want. The order formed the germ of that noble hospital the *Invalides*, which was founded by Louis XIV., and which served as a model for our own hospitals of Chelsea and Greenwich. When the Invalides was founded, the order of C. C. was superseded.

CHRISTIAN COMMISSION, The United States, an important organization in the loyal states during the war of the rebellion, to aid and co-operate with the sanitary commission, and generally to assist in the cause of the union. Its purpose was to supply material wants and comforts for the army, especially to the sick or wounded. It gave also an unsectarian religious help. Like the sanitary commission, it accomplished a vast amount of valuable work. The C. C. was originated by a call from the Young Men's Christian association of New York. It is noticeable as one of the earliest signs, as well as causes, of the growing charity among different denominations so marked in recent years.

CHRISTIAN CONNECTION, a denomination of Christians which originated about the beginning of the 19th c. in the United States of America, and is diffused over all the states. The name was assumed in avowed dislike to the acknowledgment of any human authority and to sectarian distinctions, and all doctrinal terms of communion were rejected, the Bible being adopted as the only rule of faith, and personal piety made the test of qualification for membership. The connection soon came to consist, however, almost exclusively of persons denying the divinity of Christ.

CHRISTIAN CONNECTION (*ante*), an organization of American Christians drawn mostly from the Baptist, Methodist, and Presbyterian churches in various parts of the United States. The earliest organizations were "Republican Methodists," seceders from the Methodist church in 1793, who took the name of "Christians." In 1800, there was a secession from the Baptist churches in Vermont, which soon grew to considerable importance. Nearly at the same period there was a secession from the Presbyterian church in Tennessee and Kentucky, and a separate synod was formed. These three organizations finally merged in one body, and adopted the common name of "Christians." Each congregation is independent, and they take the Bible as their standard of doctrine. They hold that the Scriptures are inspired, and are of divine authority; that

every man has the right to interpret the Bible for himself, and that therefore differences of theological views are no bar to church fellowship; that there is one God, but the doctrine of the Trinity is not generally received; that Christ is a divine being, that he pre-existed, and is the mediator between God and man; that the sufferings of Christ atone for the sins of all men, who, by repentance and faith, may be saved; that immersion is the only proper form of baptism, and believers the only proper subjects for that ordinance; that communion at the Lord's table is open to believers of all denominations. In government and usage they are congregational, each church being independent, although there are annual or state conferences which receive and ordain pastors, but can pass no laws that will be actually binding on the several churches. They have an American Christian convention, which has a regular constitution, officers, and departments. Among their institutions of learning are Hesperia and Pierce Christian colleges in California; Eureka college in Illinois; Bedford college, Butler university, and Union Christian college in Indiana; Oskaloosa college in Iowa; Eminence college and Kentucky university in Kentucky; Christian university in Missouri; Christian college in Oregon; and Bethany college in West Virginia, besides a number of theological seminaries and academies. Antioch college in Ohio, though not officially known as belonging to this connection, has had much favor in the denomination.

CHRISTIAN ERA, sometimes called the era of the incarnation, is now almost universally employed in Christian countries, and is used by some eastern nations. Its epoch, or commencement, is the 1st of Jan. in the fourth year of the 194th olympiad, the 753d year from the foundation of Rome, and the 4,714th of the Julian period. It is usually supposed to begin with the year of the birth of Christ, but there are various opinions with regard to the year in which that event took place. The general opinion seems to be that Christ was born four years earlier than the dates now used imply. The C. E. was introduced into Italy in the 6th c., and began to be used in Gaul in the 8th c., though not generally used in England before the close of the 8th century. Before its introduction the usual practice in Latin countries was to distinguish the years by their number in the indiction. In the C. E. the years are distinguished by Arabic numerals, those before the birth of Christ being marked B.C. (before Christ), or A.C. (*ante Christum*); and those after Christ A.D. (*anno Domini*, in the year of our Lord). There is difficulty in determining the years before Christ, since astronomers reckon the year preceding our era as the year 0 B.C., while chronologers call it 1 B.C. The latter seems to be correct, and by that method the leap years before Christ fall on the years 1, 5, 9, 13, etc., while those after Christ fall upon 4, 8, 12, etc. Dates of the C. E. are greatly confused by variations of time for the beginning of the year. Dionysius, who was the author of the C. E., began the first year on the 25th of Mar., or on the day of the Annunciation to the virgin Mary, 9 months before the birth of Christ. By this calculation the C. E. began 9 months and 7 days before our year 1, which began on the 1st of January. This beginning the year on the 25th of Mar. was the practice in most Italian states as late (in Pisa) as 1745. It was adopted in some papal documents, and it was employed in France about the middle of the 11th century. In some instances the year was counted from the 25th of Mar. following our epoch, which would be 2 months and 24 days after our beginning of the era. A few writers of the 6th and 7th centuries began the year on the 1st of January. In France, the practice as late as the middle of the 16th c. was to begin the year with Easter; but in 1663 Charles IX. directed that thereafter the year should commence on the 1st of January. In Germany, about the 11th c., it was usual to begin the year with Christmas, and this practice prevailed at Milan, Rome, and other Italian cities in the 13th, 14th, and 15th centuries. In England, the practice of beginning the year at Christmas was introduced in the 7th c., and traces of it are found down to the 13th century. Gervase of Canterbury mentions that most writers of his country agreed in regarding Christmas as the first day of the year, because it formed the term at which the sun finished and recommenced his annual course. This is a remnant of the old Norse religion. In the severely cold regions of Scandinavia the return of the sun from its extreme southern declination was hailed with great rejoicing; the great yule festival was held, and offerings and thanksgiving marked the period. This was, of course, at the winter solstice, in early ages very nearly on the day of Christmas. When Anschar and other Roman Catholic missionaries penetrated to Denmark, they engrafted upon the heathen yule the Christian Christmas, and for the return of the material sun they taught the rising of the son of God. Thus, the church Christmas may be the successor not only of the Roman saturnalia, but of the Odinic yule. The memory of the latter is still strong among the rural population of England. In England, in the 12th c., the practice prevailed of beginning the year on the Annunciation, the 25th of Mar., and that was the general practice until the reformation of the calendar, in 1751, by a parliamentary law, which directed that the year 1752 should be reckoned from the 1st of Jan., thus leaving 1751 nearly three months short. English authors, however, have endeavored to make the beginning of the historical year on the 1st of January. The liturgic year of the church of England began with the first Sunday in Advent, the Lord's day before Christmas. These variations in the commencement of the year lead to much confusion in dates. The English revolution is popularly called the revolution of 1688; but if we reckon

from the 1st of Jan., it began in 1689. In the tables of modern works on chronology, the birth of Christ is placed in the year 4 before Christ. Some recent chronologers of eminence place the Nativity nearer the Christian era. Eusebius dates the crucifixion in the year 33 A.D.; but Augustine, Origen, and others, place it in the year 29 A.D. In either case, the long-established date of the commencement of the C. E. is not altered. See CHRONOLOGY.

CHRISTIANA, Del. See page 897.

CHRISTIANCY, ISAAC P. See page 897.

CHRISTIAN'IA, a province in s. Norway; about 10,000 sq.m.; pop. '76, 489,915. It is a rough, mountainous region containing many lakes, and is traversed by the Glomer, the Drammen, and other rivers. The mineral products are copper, silver, and iron. Agriculture is scarcely profitable, though cattle and horses are raised in large numbers. The chief article of export is lumber.

CHRISTIAN'IA, capital of Norway, is situated in the province of Aggerhuus, in a beautiful open valley on the northern side of the Christiana fiord. Pop. '81, 119,407. C. is the seat of the Norwegian government, the superior courts, and the *storthing*. Besides the suburbs of Pipervigen, Hammarsborg, Vaterland, and Groenland, the town consists of C. properly so called (which was laid out by Christian IV. in 1614, in the form of a regular parallelogram of 1000 paces in length and breadth); the Old Town or Opslo, where the bishop resides; and the citadel Aggerhuus, from which the broad straight streets of the town can be fired upon. The most important public buildings are the royal palace, the bank and exchange, the house of representatives or storthing, the governor's palace, and the cathedral. To these may be added the university, the only one in Norway, which was opened in 1813, and possesses a staff of 41 ordinary and 6 extraordinary professors. About 800 students attend it annually. This institution contains, besides various scientific collections, a library of about 150,000 books, a botanical garden, and an observatory (in 59° 54′ 42″ n. lat., and 10° 50′ e. long.). The latter was opened in 1833. C. has also some good schools and learned societies, of which the "society for northern antiquities" is famous. The manufactures of C. are cotton, oil, paper, soap, and bricks. There are also numerous distilleries and corn-mills. It exports in considerable quantities wood, iron, anchovies, and glasswares. In 1871, 1894 vessels of 262,853 tons entered the port (which, however, is covered with ice for four months). It has a regular steamboat communication with Gottenburg, Copenhagen, Kiel, Hull, and Leith. C., by means of its bay, is connected with Drammen (pop. 18,838), famous for its extensive trade in timber, etc. The scenery of the whole bay is unsurpassed in beauty.

CHRISTIAN'ITY. It is proposed in the present article to give a very brief outline of the system of the Christian religion, and of the evidences by which its truth is established. The principal parts, both of the system and evidences of C., will be found noticed under separate heads.

C. comes to us with a claim to be received as of divine origin. It is no product of the human mind, but has for its author the Being whom it sets before us as the object of worship. It is consequently altogether exclusive; it claims to be deemed the only true religion—"the truth"—and admits of no compromise or alliance with any other system.

C. cannot be viewed as distinct from the religion of the Jews and of the patriarchs; it is the same religion accommodated to new circumstances; there has been a change of *dispensation* only. In studying either the system or the evidences of C., we are compelled continually to revert from the New Testament to the Old, and must in some measure trace the history of the true or revealed religion through the previous and preparatory dispensations.

The whole system of C. may be regarded as having its foundation in the doctrine of the existence of one God. See GOD. Next to this may be placed the doctrine of the fall (q.v.) of man. Man is represented as involved in misery by sin (q.v.)—*original* and *actual*—and every individual of the human race as incapacitated for the service and fellowship of God, obnoxious to the displeasure of God, and liable to punishment in a future and eternal state of being. See PUNISHMENT, FUTURE. And here we may regard the doctrine of the atonement (q.v.) as next claiming our attention—a doctrine taught in all the sacrifices (see SACRIFICE) of the patriarchal and Jewish dispensations, as well as by the words of inspired teachers. Man being utterly incapable of effecting his own deliverance from sin and misery, God sent his Son to save sinners, to deliver them from hell, to make them holy, and partakers of the eternal joy and glory of heaven.

By those who regard Christ as a mere creature, *atonement* or *reconciliation* with God is made to depend on the repentance of man as its immediate cause; whilst the life and death of Christ are represented as merely an example to us of obedience, virtue, and piety in the most trying circumstances; the doctrines of a propitiatory sacrifice, a substitutionary obedience, and an imputed righteousness, with all that form part of the same system, falling completely and even necessarily to the ground. These doctrines, however, are all consistently maintained in connection with the doctrine of the Trinity and the generally received doctrine as to the person of Christ. See CHRIST and TRINITY The very incarnation (q.v.) of the Son of God is regarded as a glorious display of the divine condescension, and a wonderful exaltation of human nature; whilst a personal enjoyment of the highest dignity and bliss of which humanity is capable in the favor and fellowship of God for ever, is to be attained by faith in Jesus Christ. See FAITH and JUSTIFICATION.

The indissoluble connection between faith and salvation arises from the divine appointment, but secures a moral harmony, as it provides for bringing into operation—in accordance with the intellectual and moral nature of man—of most powerful and excellent motives for all that is morally good, the partakers of salvation being thus fitted for the fellowship of him into whose favor they are received; and as it prevents the possibility of any of them taking to themselves, or giving to others, the glory of that salvation which they really owe to Christ, and which they must therefore ascribe to Christ, as God is a God of truth, and truth must reign in the kingdom of heaven.

Salvation is ascribed by all Christians to the grace of God. The mission of Christ was an act of supreme grace; and all must be ascribed to grace for which we are indebted to Christ. The doctrine of grace, however, is part of the system of C. on which important differences subsist, especially as to the relation of the grace of God to individual men. Such are the differences concerning election (q.v.), and concerning the origin of faith, and man's ability or inability to believe of himself. But by Christians generally, the personal relation of the believer to Christ, and his faith in Christ, are ascribed to the Holy Ghost or Spirit of God, the third person of the Godhead, and so to the grace of God. See ARMINIUS, CALVINISM, and PELAGIUS.

In the view of all who hold the doctrine of the Trinity, the doctrines concerning the Spirit of God form a very important part of the Christian system. To the agency of this person of the Godhead, besides all that is ascribed to Him concerning the human nature of Christ, we are indebted for all that is spiritually good in man; He, in the economy of grace, being sent by God, on the intercession of Christ, to communicate the blessings purchased by Christ in his obedience and death. See HOLY GHOST.

Salvation begins on earth; and whenever a man believes in Christ, he is a partaker of it—is in a state of salvation. It forms an essential part of the Calvinistic system, that he who is in a state of salvation always remains so, and that the salvation begun on earth is in every case made perfect in heaven. See PERSEVERANCE OF SAINTS. Thus salvation is viewed as beginning in regeneration (q.v.), and as carried on in sanctification (q.v.), and all its joys as connected with the progress of sanctification. Faith in Jesus Christ cannot be unaccompanied with repentance, and repentance is always renewed when the exercise of faith is renewed. For although all believers are *saints* or *holy*, as set apart to God, and in contrast to what they previously were, yet there is none in this life free from temptation and sin; the successful tempter of our first parents, who assailed our Saviour with temptation and was defeated, being still the active enemy of man, against whom believers in Jesus Christ are called to contend, to watch, and to pray. See DEVIL. The sense of responsibility belongs to human nature; and the doctrine of a judgment (q.v.) to come may be considered as to a certain extent a doctrine of natural religion, as may also that of the immortality (q.v.) of the soul; but the clear and distinct enunciation of these doctrines belongs to the Christian revelation, to which belongs entirely the doctrine of the resurrection (q.v.) of the dead.

Of the moral part of C., which has already been referred to, it may be sufficient here to state, that it is as harmonious with the doctrinal as it is inseparable from it; that it is founded upon the attributes of God, and is perfectly illustrated in the character of Jesus Christ; and that it is divisible into two great parts—one, of the *love of God*, and the other, of the *love of man*, or of ourselves and our neighbors. See LAW, MORAL.

The *means of grace*, or of the attainment or the blessings of salvation, form an important part of the Christian system. Of these the WORD OF GOD—or divine revelation contained in the Bible (q.v.)—first claims attention as the means of *conversion* to Christ, and of *edification* in Christ, the instrument by which salvation is both begun and carried on in men. The ordinances of God's worship are among the means of grace. Thus prayer (q.v.) is one of the chief means of grace. The sacraments (q.v.) are means of grace, concerning the precise use of which, and their relative importance as compared with the other means, considerable difference of opinion prevails among Christians. The same remark applies also to the combination of Christians into an organized body or community, the church (q.v.) with its own laws or system of church government (q.v.) and church discipline (q.v.).

We have endeavored to sketch the outline of the system of C., as much as possible according to the general belief of Christians, merely indicating the points on which the chief differences of opinion exist. Some of the principal controversies will be found noticed under separate heads.

The truth of C. is established by many different *evidences*, distinct and independent, but mutually corroborative. It appeals to reason, and demands to have its claims examined and admitted. Nor is there any *faith* where there is not a mental conviction arrived at by a process of sound reasoning.

The evidences of C. are very generally divided into two great classes, *internal* and *external*—the former consisting of those which are found in the nature of the Christian system itself, and in its adaptation to the nature and wants of man; the latter, of those which are derived from other sources. The boundary between the two classes, however, is by no means so distinct in reality as it appears in the definition of the terms. Of the multitude of books which have been written on the subject of the evidences of C., some are devoted mainly to one of these classes, and some to the other; whilst some are occupied with the development of particular evidences or arguments, and some with

the refutation of objections, and in particular of what may be called a preliminary objection—that a divine revelation can never be established by sufficient evidence at all. See REVELATION.

The evidence of miracles (q.v.) and the evidence of prophecy (q.v.), two of the principal branches of the external evidences of C., will be found noticed in separate articles. Another argument, which has been much elaborated—for example, in Paley's *Evidences*—is derived from the character and sufferings of the apostles and other first preachers of C.; their high moral worth, considered along with their great earnestness and devotedness; the absence of all possibility of selfish or base motives; and at the same time, their perfect opportunity of knowing the truth or the facts which they proclaimed. A subsidiary argument is found in the admission of the great facts regarding Jesus of Nazareth, by the early opponents of Christianity. A most important and valuable argument is found in the perfect coherence of all the parts of the Christian system, and in the agreement, as to the religion which they teach, of all the books of Scripture, notwithstanding the widely different dates of their composition, and their very different nature in other respects. See BIBLE. The relation of the Jewish ceremonies to the doctrines of C. supplies another argument of this kind, capable of being developed in a multitude of particulars. The minor coincidences between the different books of Scripture have been pointed out with happy effect in the *Horæ Paulinæ* of Paley, and in other works. The character of our Savior supplies an argument of great power: the impossibility of the invention of such a character, and of the history in which it is exhibited, by any effort of human genius, is also urged as corroborative; and the inconsistency of the morality displayed, with the supposition of imposture, has been dwelt upon with the same view. The excellency, both of the doctrinal and moral part of the system of C., its elevating and purifying tendency, the agreement of its doctrine with the facts of man's sinfulness and misery, and the suitable provision which it makes for his most deeply felt wants, are principal branches of the internal evidence of its truth. The effects of C., where it has prevailed, supply a confirmatory argument in its favor, which has formed the subject of works of great learning and interest. See EVIDENCES OF CHRISTIANITY.

CHRISTIAN KNOWLEDGE, SOCIETY FOR PROMOTING, one of the great religious associations connected with the church of England, and the oldest of them all. It was founded in 1698, although it did not receive its present name till 1701; and had for its object: "1. To promote and encourage the erecting of charity schools in all parts of England and Wales. 2. To disperse, both at home and abroad, Bibles and tracts of religion; and, in general, to advance the honor of God, and the good of mankind, by promoting Christian knowledge, both at home and in other parts of the world, by the best methods that should offer." These objects it has never ceased to pursue, chiefly directing its efforts to the British dominions; partaking at once of the nature of an educational association, a missionary society, a Bible society, and a religious tract society; and notwithstanding the operations of other great societies in these several departments of Christian benevolence, its revenue amounts to about £100,000 a year. The Protestant missionaries who labored in the s. of India in last century, were supported chiefly by this society, which has also contributed largely of its funds for the establishment of Christian schools in that country.

CHRISTIAN NAME. See NAME.

CHRISTIANSAND', the principal t. of the province or *stift* of that name in Norway, is situated at the mouth of the Torridalself, in the bay of Christiansand. Pop. '75, 12,137. C. is the residence of a bishop and high-bailiff or stift-amtmand, and possesses a branch of the Norwegian bank, a gymnasium, and several charitable foundations. The manufactures are leather, tobacco, cotton, etc. Ship-building forms also a considerable branch of its industry. The town, which was built in 1641 by Christian IV., has an excellent harbor, divided into two parts by the island of Oddern, upon which are situated the quarantine hospital and custom house. C. exports wood, lobsters, and salmon in large quantities. The town and harbor are protected by several fortifications. To the west of C. lies the harbor of Ny-Hollesund.

CHRISTIANSBURG, Va. See page 897.

CHRIS'TIANSFELD, a settlement of Moravian brothers, in the northern part of Schleswig, was founded in 1772. It consists of 64 houses and about 700 inhabitants. The houses, which are well built, and cheerful in appearance, are arranged in two parallel streets, with the church upon a green plot in the middle. The settlement is represented by the inspectors or chiefs appointed by the directors of the fraternity, and the representatives elected by the members of the sect. The manufactures are linen, soap, cotton, leather, etc.

CHRISTIANS OF ST. JOHN, or NAZAREANS, a sect in Persia, in the country around Bassorah. They seemingly deify John the Baptist and consider Jesus an impostor. They say that they dwelt on the Jordan in the time of Jesus, but were driven from Palestine by the Mohammedans. Their name "Christians" is wholly a misnomer. They consider the Jehovah of the Jews a spurious divinity, and Christ a false teacher; that the world was created by seven angels of darkness who inhabit the seven planets, and there is also a kingdom of light superintended by good angels. Behind these kingdoms is a region of splendor, and there is the supreme original being, Ferha, and the

female principle, Ajar. There are conflicts between the worlds of darkness and of light, but light is to triumph. The Mosaic and Christian systems of religion came from the region of darkness; but that of John the Baptist from the region of light. Baptism is the means of introducing men to the kingdom of light. John was married, but his children sprang from the Jordan. These people practice polygamy, and forbid mourning for the dead. They have five sacred books, of which four are doctrinal, and one treats of astrology. It is supposed that, 200 years ago, they numbered about 100,000.

CHRISTIANS OF ST. THOMAS, the name of a branch of an old Persian church still existing on the Malabar coast, formed originally by excommunicated Nestorians. Their liturgy is in the Syriac language. They still celebrate the early agape or love feast, use bread, salt, and oil in the communion of the supper, and anoint infants in baptism. Their priests are allowed to marry. While the Portuguese held Malabar they were submissive to the Roman Catholic church, but as soon as the Dutch took control the Nestorian system was resumed.

CHRISTIANSTAD', the strongly fortified capital of a province of the same name in the s. of Sweden. It is situated on the Helge, about 9 m. from the Baltic, and 265 s.w. of Stockholm. C. is the residence of a governor, and the seat of a court of justice. It is a beautifully built town, and possesses an arsenal, a school, a magnificent church, and a senate-house. Pop. 9,203 employed chiefly in the manufacture of woolen goods, leather, gloves, etc. There is also some trade in wood, pitch, potash, etc. The town, which was founded by Christian IV., has suffered many sieges during the wars between Denmark and Sweden. The province of Christianstad has an area of 2,400 m.; pop. '80, 230,619.

CHRIS'TIANSTED, the chief t. of the Danish island of St. Croix, in the West Indies. It stands on the n.e. coast of the island, and has an excellent harbor, which is defended by a fort and a battery. Here resides the governor-general of the Danish West Indies The number of its inhabitants is 5,700. .

CHRISTIANSUND', a seaport on the w. coast of Norway, 85 m. w.s.w. of Trondhjem, in 63° 3′ n., and 7° 40′ e.; pop. 5,709. The town is built on three small islands by which its harbor is inclosed. The chief exports are fish and fish products.

CHRISTIAN UNION CHURCHES, an organization projected at Columbus, Ohio, in 1865, and supposed to have 30,000 to 40,000 members, principally in the western and south-western states. Their leading doctrines, as stated in their publications, are: the oneness of the church, with Christ the only head, and the Bible the only rule of faith and practice; the good works of a Christian life the only condition of fellowship; the suppression of controversy; local or congregational church government; no preaching of party politics. They adopt the motto, "In things essential, unity; in non-essentials, liberty; in all things, charity." Baptism is a condition of membership, but in communion they are practically unrestricted.

CHRISTI'NA, Queen of Spain. See MARIA CHRISTINA.

CHRISTI'NA, Queen of Sweden, only child of the great Gustavus Adolphus, was b. Dec., 1626, and succeeded her father in 1632, when only six years old. Distinguished equally by beauty and the possession of a lively imagination, a good memory, and uncommon intelligence, she received the education rather of a man than of a woman; and to this may in part be attributed the many eccentricities of her life. During her minority, the kingdom was governed by the five highest officers of the state, the principal being chancellor Oxenstiern. In 1644, she assumed the reins of power, and, in 1650, was crowned with the title of *king*. She had previously declared her cousin, Charles Gustavus, her successor. For four years thereafter, she ruled the kingdom with vigor, and was remarkable for her patronage of learned and scientific men. In 1654, however, at the age of 28, weary of the personal restraint which royalty imposed on her, she abdicated in favor of her cousin, reserving to herself sufficient revenues, entire independence, and supreme authority over her suite and household. Leaving Sweden, she proceeded to Brussels, where she embraced the Roman Catholic religion. She afterwards went to Rome, which she entered on horseback, in the costume of an amazon, with great pomp. Confirmed by pope Alexander VII., she adopted the surname of Alessandra. In 1656, she visited Paris; and the following year, on a second residence there, she caused her grand equerry, Monaldeschi, who had enjoyed her entire confidence, to be executed in her own household for treason. In 1658, she returned to Rome, and, in 1660, the death of the king, her cousin, caused her to hasten to Sweden; but, failing in her attempt to be reinstated on the throne, she again left the country. In 1666, she aspired to the crown of Poland, but was unnoticed by the Poles. The remainder of her life was spent in Rome in artistic and scientific pursuits. Besides founding an academy, she collected valuable MSS., medals, and paintings, and died April 19, 1689. Much of her conduct favors the idea that at times she was scarcely sane.

CHRISTI'NOS, a political party in Spain during the regency of queen Christina, who were opposed to the Carlists.

CHRIS'TISON, Sir ROBERT, D.C.L., an eminent physician, son of Alexander Christison, professor of humanity in the university of Edinburgh, was b. at Edinburgh, July

18, 1797; was educated at the high school of his native place, and, in 1811, became a student at the university there. After graduating in 1819, he proceeded to London and Paris; and, in the French capital, studied toxicology under the celebrated Orfila, a department of medical science in which in Britain his name has become eminent. Commencing the practice of medicine at Edinburgh, he was, in 1822, appointed professor of medical jurisprudence in the university of that city, and, in 1832, was promoted to the chair of materia medica. Besides contributing papers on various subjects to medical journals, C. is author of a *Treatise on Poisons*, published in 1829, recognized as a standard work on the subject; *Biographical Sketch of Edward Turner, M.D.*, 1837, being an address delivered before the Harveian society of Edinburgh; a treatise *On Granular Degeneration of the Kidneys*, 1839; and *The Dispensatory, a Commentary on the Pharmacopœias of Great Britain*, 1842. Twice president of the royal college of physicians, Edinburgh, and ordinary physician to the queen in Scotland, in 1871 he was created a baronet. In 1877, sir Robert retired from professorial and other public work.

CHRISTLIEB, Theodor, D.D., b. 1833; a native of Wurtemberg; educated at Tubingen, a teacher in France, a preacher in London, and an author of lectures on *Modern Doubt and Christian Belief*. He returned to Germany in 1865, and was made professor of theology at Bonn. In 1873, he was a delegate to the evangelical alliance, meeting that year in New York. At its sessions his addresses excited great interest.

CHRISTMAS, the day on which the nativity of the Savior is observed. The institution of this festival is attributed by the spurious Decretals to Telesphorus, who flourished in the reign of Antoninus Pius (138–61 A.D.), but the first certain traces of it are found about the time of the emperor Commodus (180–92 A.D.). In the reign of Diocletian (284–305 A.D.), while that ruler was keeping court at Nicomedia, he learned that a multitude of Christians were assembled in the city to celebrate the birthday of Jesus, and having ordered the church doors to be closed, he set fire to the building, and all the worshipers perished in the flames. It does not appear, however, that there was any uniformity in the period of observing the nativity among the early churches; some held the festival in the month of May or April, others in Jan. It is, nevertheless, almost certain that the 25th of Dec. *cannot* be the nativity of the Savior, for it is then the height of the rainy season in Judea, and shepherds could hardly be watching their flocks by night in the plains.

C. not only became the parent of many later festivals, such as those of the Virgin, but especially from the 5th to the 8th c., gathered round it, as it were, several other festivals, partly old and partly new, so that what may be termed a *Christmas cycle* sprang up, which surpassed all other groups of Christian holidays in the manifold richness of its festal usages, and furthered, more than any other, the completion of the orderly and systematic distribution of church festivals over the whole year. Not casually or arbitrarily was the festival of the nativity celebrated on the 25th of Dec. Among the causes that co-operated in fixing this period as the proper one, perhaps the most powerful was, that almost all the heathen nations regarded the winter-solstice as a most important point of the year, as the beginning of the renewed life and activity of the powers of nature, and of the gods, who were originally merely the symbolical personifications of these. In more northerly countries, this fact must have made itself peculiarly palpable—hence the Celts and Germans, from the oldest times, celebrated the season with the greatest festivities. At the winter-solstice, the Germans held their great yule-feast (see Yule), in commemoration of the return of the fiery sun-wheel; and believed that, during the twelve nights reaching from the 25th Dec. to the 6th Jan., they could trace the personal movements and interferences on earth of their great deities, Odin, Berchta, etc. Many of the beliefs and usages of the old Germans, and also of the Romans, relating to this matter, passed over from heathenism to Christianity, and have partly survived to the present day. But the church also sought to combat and banish—and it was to a large extent successful—the deep-rooted heathen feeling, by adding—for the purification of the heathen customs and feasts which it retained—its grandly devised liturgy, besides dramatic representations of the birth of Christ and the first events of his life. Hence sprang the so-called "manger-songs," and a multitude of C. carols, as well as C. dramas, which, at certain times and places, degenerated into farces or fools' feasts (q.v.). Hence also originated, at a later period, the Christ-trees, or Christmas-trees, adorned with lights and gifts, the custom of reciprocal presents, and of special C. meats and dishes, such as C. rolls, cakes, currant-loaves, dumplings, etc. Thus, C. became a universal social festival for young and old, high and low, as no other Christian festival could have become.

In the Roman Catholic church, three masses are performed at C.—one at midnight, one at daybreak, and one in the morning. The day is also celebrated by the Anglo-Catholic church—special psalms are sung, a special preface is made in the communion service, and the Athanasian creed is said or sung. The Lutheran church, on the continent, likewise observes C.; but the Presbyterian churches in Scotland, and the whole of the English dissenters, reject it, in its religious aspect, as a "human invention," and as "savoring of papistical will-worship," although, in England, dissenters as well as churchmen keep it as a social holiday, on which there is a complete cessation from all business. But within the last hundred years, the festivities once appropriate to C. have

much fallen off. These at one time lasted with more or less brilliancy till Candlemas, and with great spirit till twelfth-day; but now a meeting in the evening, composed, when possible, of the various branches and members of a family, is all that distinguishes the day above others.

CHRISTMAS-BOX, a small money-gift to persons in an inferior condition on the day after Christmas, which is hence popularly called *boxing-day*. The term, and also the custom, are essentially English, though the making of presents at this season and at the new year is of great antiquity. A number of interesting particulars concerning the Christmas-box will be found in Brand's *Popular Antiquities*. Here, we need refer only to the usage in its later aspect. Within the memory of middle-aged persons, the practice of giving Christmas-boxes, or petty presents, to apprentices, domestic servants, and tradesmen, had become a serious social nuisance, more particularly in London, where every old custom seems to linger, and is most difficult to be got rid of. Householders felt under an obligation to give money to the apprentices in the shops where they dealt, also to various inferior parish officers, including scavengers and lamplighters; while shopkeepers, on the other hand, were equally impelled to make presents to the male and female servants of their customers. Thus, as referred to in *Christmas*, a poem:

> "Gladly, the boy, with Christmas-box in hand,
> Throughout the town his devious route pursues;
> And, of his master's customers, implores
> The yearly mite: often his cash he shakes;
> The which, perchance, of coppers few consists,
> Whose dulcet jingle fills his little soul
> With joy."

At length the Christmas-box system became such an intolerable grievance, that tradesmen stuck up notices in their windows that no Christmas-boxes would be given; and at the same time, the public authorities issued remonstrances to the same effect. At Christmas, 1836, the secretary of state for foreign affairs issued a circular to the different embassies, requesting a discontinuance of the customary gifts to the messengers of the foreign department, and other government servants. Since this period, the practice has greatly decreased, doubtless to the improvement of the self-respect of the parties interested.

CHRISTMAS CAROLS. The word carol (Ital. *carola*, and Fr. *carole*, a round dance—probably from Lat. *corolla;* Welsh, *coroli*, to reel, to dance; the name is thence applied to the music or song accompanying such a dance: *carillon* is probably allied) signifies a song of joy. The practice of singing carols, or, at all events, sacred music, in celebration of the nativity of Christ as early as the 2d c., is considered as proved by the circumstance that a large sarcophagus belonging to that period has sculptured upon it a representation of a Christian family joining in choral praise for this purpose. A century or two after this, however, the C. C. seem to have sadly degenerated, and become, in fact, so indecent, that the clergy found it necessary to forbid them. Under the Anglo-Saxon kings, merriment and piety were pleasantly combined in English life, a peculiarity that affected the C. C. of that period not a little; but by the 13th c. the jocosity had unhappily lapsed into what would now be considered profanity. The oldest printed collection of English C. C. bears the date of 1521. The majority of these, though written by men of learning—priests and teachers—exhibit a lamentable ignorance of the character of the two most prominent persons in the carols—Mary and Jesus. In 1525 was kept the "still Christmas," on account of the illness of king Henry; but with this exception, the sacred season appears to have been regularly celebrated with joyous music and songs during the Tudor period. In 1562, C. C. of a more solemn nature were introduced. By the Puritan parliament, Christmas was abolished altogether, and holly and ivy were made seditious badges; and in 1630 the Psalms, arranged as carols, were advertised. After the restoration, the C. C. again exhibited a hearty, cheerful, and even a jovial character. Those with which the dawn of Christmas is now announced in England are generally religious, though not universally so. In France, the carols at this season used to be much less sacred than gay. Often, indeed, they were grossly Bacchanalian.

See an interesting paper in the *Athenæum* for Dec. 20, 1856; also Sandys's *Christmas Carols*, 8vo, 1833; Sylvester's *Christmas Carols and Ballads*.

CHRISTMAS ROSE. See HELLEBORE.

CHRISTOL'OGY is the doctrine of the person of Christ. The word itself is to be found, once or so, in the divines of the 17th c. (see Dean Trench on the *Study of Words*), but the department of scientific theology which it now represents is almost entirely the growth of modern, and particularly of German inquiry. As yet, it can hardly be said that the word C. is accredited in Great Britain, but the same differences of opinion which led to its adoption in Germany, are beginning to manifest themselves here also. There are only three methods of apprehending the doctrine of the person of Christ. First, there is the *rationalistic* method. This consists in representing the development of the Messianic idea in Jewish history as purely natural, and conditioned by purely human and historical influences—in short, as a subjective or self-originated notion, to which there was no correspondent divine reality. Second, there is, what, for want of a better word, we may call the *spiritualistic* method (that of theologians like Neander, Rothe, etc.). This consists in representing the development of the Messianic idea in Jewish

history as both natural and supernatural; that is to say, it asserts the existence of a divine objective reality ("the eternal Son of God") as the basis of the subjective idea in the minds of the Jews, and regards the growth of that idea, and the influence of historical circumstances, as the result of a supernatural providence, which culminated in the revelation "of the mystery of godliness, God manifest in the flesh." Third, there is the *dogmatic* method, which is the one accepted by the common order of theologians. This consists in representing the doctrine of the person of Christ as *symbolically* known to the spiritually-minded among God's people from the earliest ages. "Abraham saw his (Christ's) day afar off." This is interpreted to signify that, by the grace of prophetic illumination, the righteous men of old were enabled to foresee in a mysterious and inexplicable manner the atonement of Christ, as it happened in history. Admitting with the spiritualistic theologians, that the Messianic idea among the Jews underwent, in some sense, a historical development, the dogmatic Christologists differ, in general, from the former by attributing to the higher minds such a knowledge of the *work* of Christ, as logically involves a knowledge of his person and character. The entire absence, however, of any *personal* traits of Christ in the Old Testament, such as might be expected of those who had seen him even with the eye of faith, has induced many orthodox theologians to shrink from making any statement in regard to what may have been the doctrine of the person of Christ among the ancient Jews.

CHRISTOPHE, Henri, king of Hayti, b. Oct. 6, 1767, was at one period a slave and tavern-cook in Cape Town, St. Domingo, and afterwards overseer of a plantation. In 1790, he joined the black insurgents against the French, and, from his gigantic stature, energy, and courage, soon became a leader among them. By Toussaint Louverture, he was appointed brig.gen., and employed to suppress an insurrection headed by Moyse or Moses, his nephew. C. captured the latter, and on his execution, succeeded him as governor of the northern province of French St. Domingo. In 1802, he gallantly defended Cape Town when gen. Leclerc arrived there with a French army destined for the reduction of the blacks, and effected his retreat with 3,000 men, after having burned the greater part of the town. The perfidious seizure of Toussaint he amply revenged, and during the short-lived government of Dessalines, who was slain by a military conspiracy in Oct., 1806, C. was gen.-in-chief of the Haytian army. In Feb., 1807, he was appointed president of Hayti for life. A republic being, about the same time, organized at Port-au-Prince, with Petion at its head, civil war commenced between them. On Mar. 28, 1811, C. was proclaimed *king* of Hayti, by the name of Henri I., and solemnly crowned, June 2, 1812. In 1814, he and Petion suspended hostilities, and by his power and skill, C. was enabled to counteract the attempts made by France to regain its authority in the island. His avarice and cruelty led to an insurrection, which was aided by gen. Boyer, who had succeeded Petion in 1818; and the rebellion having spread to Cape Town, C.'s deposition was proclaimed, at the head of the troops, by the duke of Marmalade, one of the first dignitaries in the kingdom. Deserted by his body-guard and all his nobles, he shot himself, Oct. 8, 1820. He left a code of laws, which he called the "Code Henri," in imitation of the Code Napoleon.

CHRISTOPHER, Herb. See Actæa.

CHRISTOPHER, Saint, a saint of the Roman Catholic and Greek churches. He is supposed to have suffered martyrdom about the middle of the 3d century. According to vulgar legend, C., whose name was originally *Adokimos* (the unrighteous), was a native of Palestine, Syria, or Lycia, and a person of prodigious bulk and strength. His height was 12 feet. So proud was he of his gigantic frame, that he would serve only the mightiest princes. Having attached himself to one, who went for the greatest of his day, C. stayed with him for a short time, but soon discovered that his master was terribly afraid of the devil, in consequence of which, C., with fearless consistency, passed into the service of the latter. One day, however, when the devil and he chanced to be walking through a wood, they came across an image of Christ. His new master exhibited such perturbation and alarm at the sight, that C. entirely lost confidence in him, and resolved to find out the Savior, and follow him. For a long while he searched in vain, but finally he fell in with a hermit, who showed him Christ, and baptized him. C. despised the customary penances, and in consequence, it was imposed on him to carry Christian pilgrims on his shoulders over a stream which had no bridge. One day, a little child came to the stream; C. took it on his shoulders, but soon began to sink under the weight of his burden. The child was Christ himself, and to prove it, he commanded C. to stick his staff into the ground. He did so, and next morning it had blossomed into a palm-tree bearing fruit. This miracle converted thousands to Christianity. C.'s success excited the enmity of Dagnus, the prefect of that region, who put him in prison, scourged him with red-hot rods, put a burning helmet on his head, and clapped him on a burning stool. C. still remained uninjured. Multitudes of poisoned arrows were now discharged against him, but they rebounded from his charmed body, and one even wounded the prefect himself in the eye. C. pitied his tormentor, and freely offered his head to the executioner, that the prefect might be healed by the blood which should flow from it. This was done, and, as a matter of course, Dagnus and his family became Christians. The Greek church celebrates his festival on the 9th of May: the Roman Catholics, on the 25th of July.

St. C. was greatly invoked in times of pestilence, or when people were digging for treasures, to frighten away the spirits who watched over them. The formula used was called a *Christopher's prayer*. He was also the patron of an order of moderation, founded in Austria in 1517, for the purpose of checking excessive drinking and swearing, and which was called the order of St. Christopher.

CHRISTOPHER'S, St., or, popularly, *St. Kitts*, an island near the n.c. bend of the great arch of the Antilles, 46 m. to the w. of Antigua, and 2 m. to the n. of Nevis. With a very unequal breadth, it is 20 m. long from s.e. to n.w., containing about 44,000 acres, and (1881) 29,137 inhabitants. It belongs to Great Britain, and has a legislature of its own, with an executive immediately subordinate to the governor-in-chief of the Leeward group, residing in Antigua. In 1880, the revenue of the colony was £32,000, having been only £3,638 in 1834; so that, under the system of free labor, it had increased nearly nine-fold in 42 years. During the same interval, the imports had risen in value from £63,018 to £168,000, and the exports from £105,267 to £186,000. The staple exports are sugar, rum, and molasses. The debt of the island in the year 1880 amounted to £3,700. Education is in a promising condition. In the year 1865, there were 27 schools receiving government aid, attended by 1367 pupils in all—11 of the establishments belonging to the church of England, 8 to the Moravians, and 8 to the Wesleyans.

The chief towns, both of them seaports with open roadsteads, are Basse-Terre, defended by fort Smith, and Sandy Point, protected by fort Charles and Brimstone Hill. Of fort Smith, the exact lat. and long. are 17° 17′ 7″ n., and 62° 48′ west. The mean annual temperature of these places, and of the coast generally, is about 80° F.; but the mornings and evenings, even of the hottest days, are agreeably cool. The length of the island is traversed by a well-wooded ridge of volcanic origin, which has in its center a crater; and towards the w. extremity of the range, rises the nearly perpendicular crag of Mt. Misery, with an altitude of 3,711 ft. above the level of the sea. Over the adjacent slopes, which gradually descend to the water's edge, this central range sends down several streams—almost every plantation, in fact, receiving its rivulet in the rainy season. The springs, though numerous, are yet mostly brackish; and indeed the southern extremity of the island presents a number of salt ponds.

St. Kitts, appropriately named by the natives "the fertile isle," was discovered by Columbus in 1493, and colonized by the English in 1623, who were almost immediately joined by some French adventurers. After treacherously exterminating the Caribs, the French and English, often quarreling, occupied the island, till, in 1713, the treaty of Utrecht gave the whole to England. In 1782, during the war of American independence, St. Kitts was captured by the French, but restored. On July 31, 1865, a terrific fire took place at Basse-Terre.

CHRISTOP'ULUS, Athanasios, 1772–1847; a Greek poet, the son of a Wallachian priest. He studied at Buda and Padua, and became teacher in the family of the Wallachian prince Mourousi, and, after the fall of that prince, he assisted the hospodar Caradja in drawing up a code of laws for the nation. He wrote love ditties and drinking songs, which are very popular among the Greeks. He is also the author of a tragedy, and some philological works.
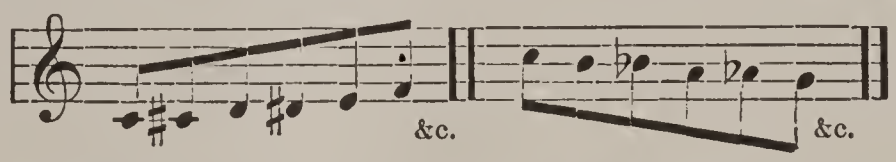
CHRIST'S COLLEGE, Cambridge, was originally founded by Henry VI., under the name of God's house, and was intended by him to consist of a master, 12 fellows, and 47 scholars. In 1505, however, there were only three fellows besides the master, when lady Margaret, countess of Richmond and Derby, mother of Henry VII., "counting herself, as of the Lancaster line, heir to all Henry VI.'s godly intentions," made up the full number, and endowed the college liberally, changing its name to Christ's college. Edward VI. added one fellow, and three scholars; and sir John Finch and sir Thomas Baines increased the number of fellows to fifteen. C. C. possesses many rich benefactions for the encouragement of students, amongst which are specially to be noticed four studentships founded by Christopher Tancred, worth £107 per annum, and tenable for three years after taking the degree of B.A. A student is elected annually before coming into residence. Amongst the illustrious men connected with this college may be noted bishop Latimer, John Milton, and Ralph Cudworth, author of the *Intellectual System*.
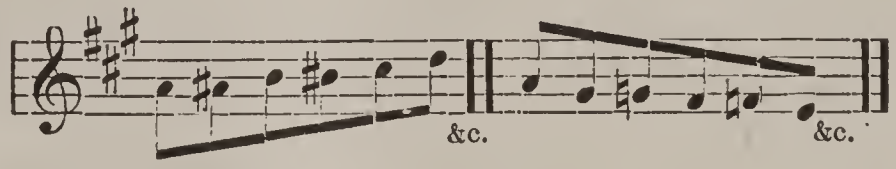
CHRIST'S HOSPITAL, Newgate street, London, was founded on the site of the Greyfriars' monastery, by Edward VI., June 26, 1553, as a hospital for orphans and foundlings. It is usually called the "blue-coat school," on account of the dress worn by the boys. This consists of a blue woolen gown or coat with a narrow red-leather girdle round the waist, yellow breeches, and yellow stockings, a clergyman's bands at the neck, and a small blue worsted cap, but this last they seldom wear, and are generally seen going about bareheaded—such has been the costume of the boys since the foundation of the school in the reign of Edward VI.; the persistency in it through successive generations, affording a curious instance of the unchangeableness in some of the English usages. No boy is admitted before seven years of age, or after 10, and none can remain after 15, with the exception of "king's boys" (i.e., those who attend the mathematical school founded by Charles II. in 1672) and "Grecians" (i.e., the highest class of scholars in the hospital), of whom eight are sent on various scholarships to the universities of Oxford and Cambridge. Altogether, about 800 boys can be admitted. The

right of presentation is vested in the managing governors. These are the lord mayor of London, the aldermen, and 12 common councilmen. Besides these, all noblemen and gentlemen who benefit the hospital to the extent of £400 are governors. The managing governors are the patrons of several churches, chiefly in Surrey and Essex. The most of the income of C. H., which amounts to about £50,000, is derived from legacies subsequent to its original charter. King Charles' foundation enriched it by £7,000, with an additional annuity of £370 10*s.*, for the purpose of educating yearly 10 boys for the sea-service. Most of the building perished in the great fire of 1666; but, through the generosity of the corporation of London, and the liberal help of wealthy Englishmen, it was soon rebuilt, under the superintendence of sir Christopher Wren. In the course of time, the new hospital fell into decay, and in 1825, a third structure was erected by Mr. Shaw. The great hall of the hospital is a magnificent room, second only to that of Westminster. C. H. is essentially a classical institution, Latin and Greek being the basis of education; but, to satisfy the wants arising from the changed condition of society, the modern languages, drawing, etc., are also taught. In 1683, the governors built a preparatory school at Hertford, where the children are trained till they are old enough to enter the hospital. The *girls*, however, remain permanently here. It can receive about 400 of both sexes. Dependent schools in Newgate street accommodate 1200 children. Several eminent persons have been educated at C. H., such as Camden, Stillingfleet, Coleridge, and Lamb.

CHRIST'S THORN. See JUJUBE and PALIURUS.

CHROMAT'IC, in music, is a term applied to a series of notes at the distance of a semitone from each other. Such a series is produced by dividing the whole tones of the diatonic scale into semitones, so that with the two diatonic semitones, already in the natural scale, the octave is divided into 12 semitones. The word C. is from the Greek, and means colored. Ascending C. passages are formed by the whole tones of the diatonic scale being raised or elevated by a sharp or a natural, according to key, and descending passages by their being lowered by a flat or a natural, thus:





It is usual to speak of the C. scale, but that is wrong, as it is only a melodious progression of semitones, certain notes of which belong to, and form the diatonic scale, showing that the foundation of the system of music does not rest on a C. basis, but on the natural diatonic progression of sounds.

CHROMATIC, in optics. See ACHROMATIC.

CHROMATICS is that part of the science of optics (q.v.) which explains the properties of the colors of light and of natural bodies. Before 1666, when sir Isaac Newton began to investigate this subject, the notions which prevailed respecting the nature of colors were purely fanciful. Till Descartes' time, indeed, it seems not to have been conceived that color had anything to do with light. As examples of the notions prevalent at very early times, we may cite those propounded by Pythagoras and Zeno. According to the former, color was the superficies of bodies; according to the latter, it was "the first configuration of matter"—whatever that may be. It is now settled that white light is not homogeneous, but consists of rays of different colors, endued with different degrees of refrangibility, and that the different colors of bodies arise from their reflecting this or that kind of rays most copiously. According to this, a body that appears red reflects red rays in greater abundance than the others; and one that appears black reflects none of the rays—in other words, absorbs all the light that falls upon it. The analysis of a beam of the sun's light by a prism was the experiment by which Newton demonstrated his great optical discovery of the unequal refrangibility of the variously colored rays, and laid the foundations for the above theory of color. The reader will find an account of this experiment, and of the most interesting phenomena presented by the spectrum, under the article SPECTRUM. Newton concluded from his experiments that white light is composed of seven colors, which he called the primary colors—viz., red, orange, yellow, green, blue, indigo, and violet, and that all other shades of color arise from the admixture of these in different proportions. Sir David Brewster, on the other hand, conceives that he has established that the primary colors are only three in number—red, yellow, and blue. This result he obtained by examining the rays of the spectrum through different absorbing media—a mode of experiment now admitted to be fallacious in principle. Professor Maxwell, by direct examination of the rays, concludes that the three primary colors are red, green, and blue. Recently, a theory has been propounded, that all the colors are the results of the admixture of white light and of shade, or darkness; but as yet no attempt has been made to support this theory by direct experiment on the sun's rays. It is rested on results obtained by combining by motion certain pro-

portions of white and black pigments on a revolving card. See the articles LIGHT, DISPERSION, and NEWTON'S RINGS.

CHRO'MATYPE (Gr. *chrome*, color; *typos*, impression), a photographic process, thus described by its discoverer, Mr. R. Hunt. One dram of sulphate of copper is dissolved in one ounce of distilled water, to which is added half an ounce of a saturated solution of bichromate of potash; this solution is applied to the surface of the paper, and when dry, it is fit for use, and may be kept for any length of time without spoiling. When exposed to sunshine, the first change is to a dull brown, and if checked in this stage of the process, we get a negative picture; but if the action of light is continued, the browning gives way, and a positive yellow picture on a white ground is obtained. In either case, if the paper, when removed from sunshine, is washed over with a solution of nitrate of silver, a very beautiful positive picture results. In practice, it will be found advantageous to allow the bleaching action to go on to some extent; the picture resulting from this will be clearer and more defined than that obtained when the action is checked at the brown stage. To fix these pictures, it is necessary to remove the nitrate of silver, which is done by washing them in pure water. If the water contains any chlorides, the picture suffers, and long soaking in such water obliterates it—or, if a few grains of common salt be added, the apparent destruction is rapid. The picture is, however, capable of restoration, all that is necessary being to expose it to sunshine for a quarter of an hour, when it revives; but instead of being of a red color, it assumes a lilac tint, the shades of color depending upon the quantity of salt used to decompose the chromate of silver which forms the shadow parts of the picture. Mr. Bingham suggested the substitution of sulphate of nickel for sulphate of copper, as yielding a higher degree of sensitiveness and greater definition. Neither process has been much used.

CHROMIC ACID, composed of trioxide of chromium and water; formula, CrO_4H_2. It forms coloring pigments, such as chromate of lead, and chromate and bichromate of potash; and is used as a caustic in surgery.

CHROMIC IRON, or CHROMITE, ore of chromium, found in Maryland, Pennsylvania, the Shetland islands, Scotland, France, and other places. It usually occurs in mass, but is sometimes crystallized in octahedrons. Oxides of chromium and iron are its ingredients.

CHRO'MIUM (*chrome*, color) is a metal, so called from the many-colored compounds it produces. It was discovered by Vauquelin in 1797. C. occurs naturally as the chromate of lead (PbO,CrO_3), and the chromite of iron, *chrome iron ore* (FeO,Cr_2O_3), at Unst and Fetlar in the Shetlands, and Portsoy in Banffshire, etc. The metal has been obtained in powder and in scales, but as a metal it possesses no interest. The principal compound of C. is the bichromate of potash, obtained by heating chrome iron ore in powder with one fourth of its weight of niter, and then digesting in water, which dissolves out the chromate of potash (KO,CrO_3), a yellow salt, and when this is acted upon by sulphuric acid, it is converted into bichromate of potash ($KO,2CrO_3$), readily crystallizes in orange-red crystals, which is soluble in water, and is largely used by the dyer and calico-printer. If this salt be added to a solution of lead, an abundant yellow precipitate occurs of chromate of lead (PbO,CrO_3), or *chrome yellow*, which is used largely by the painter as a yellow pigment. A sesquioxide of C. (Cr_2O_3), *chrome green*, possessing a bright green color, which renders it useful in enamel-painting, and being innocuous, it is now introduced into paper-hangings instead of the highly dangerous arsenical green pigment. The bichromate of potash is employed in conjunction with sulphuric acid as an agent in bleaching palm-oil and other oils and fats.

CHROMO-LITHOGRAPH. See LITHOGRAPHY.

CHRON'ICLE (from *chronos*, time), denotes a history in which events are treated in the order of time. A C. is understood to differ from annals in being more connected and full, the latter merely recording individual occcurences under the successive years or other dates. Most of our older histories were called chronicles, such as the *Saxon Chronicle*, *Holinshed's Chronicle*. The term is seldom applied to a modern book, but frequently to a newspaper—as, for instance, *The Morning Chronicle*.

CHRONICLES, the name of two of the books of the Old Testament, as found in the common English Bible. In the Hebrew canon the C. form but one book, which is entitled *Events of the Times*—and this appears to have been a designation commonly applied to special histories—in more definite shape, *Events of the Times of King David*, or the like. The Greek translators divided the long Hebrew book into two, and adopted the title *Things Omitted*, that is, not recorded in the other historical books. Jerome suggested the title *Chronicon*, whence comes the English name. The book of C. begins with Adam and ends abruptly in the middle of Cyrus's decree of restoration. The continuation of the narrative is found in the book of Ezra, which fills up the fragment of the decree of the Persian king. Of the authorship of C. nothing is known except what can be determined by internal evidence. The language implies that the book is one of the latest of the Old Testament. In the Hebrew Bible it is placed last. As to the time of the writing of C., it is argued that the chronicler wrote after the fall of the Persian monarchy. What seems to be certain and important for a right estimate of the book is that the author lived a considerable time after Ezra, and stood entirely under the influence of the religious institutions of the new theocracy. This point of view determined the nature of his interest in the early history of his people. The true

importance of Hebrew history had always centered in the fact that this petty nation was the people of Jehovah, the spiritual God. The tragic interest which distinguishes the annals of Israel from the forgotten history of Moab or Damascus lies wholly in that long contest which finally vindicated the reality of spiritual things and the supremacy of Jehovah's purpose, in the political ruin of the nation which was the faithless depositary of these sacred truths. After the captivity, it was impossible to write the history of Israel's fortunes otherwise than in a spirit of religious pragmatism. But within the limits of the religious conception of the plan and purpose of the Hebrew history more than one point of view might be taken. The book of Kings looks upon history in the spirit of the prophets. But before the chronicler wrote, the last spark of prophecy had become extinct. The Jerusalem of Ezra was organized no longer as a nation, but as a municipality and a church. The center of religious life was no longer the prophetic word, but the ordinances of the Pentateuch and the liturgical service of the sanctuary. The religious vocation of Israel was no longer national, but ecclesiastical and municipal; and the historical continuity of the nation was vividly realized only within the walls of Jerusalem and the courts of the temple, in the solemn assembly and stately ceremonial of a feast day. These influences naturally operated most strongly on those who were officially attached to the sanctuary. To a Levite, even more than to other Jews, the history of Israel meant above all things the history of Jerusalem, of the temple, and of the temple ordinances. The author of C. betrays in every page his essentially Levitical habit of mind. To such a mind, in the fallen condition of the Jews as a political nation, there seemed to be room for a new history, which should confine itself to matters still interesting to the theocracy of Zion, keeping Jerusalem and the temple in the foreground, and developing the divine significance of the history in its causes and results, not so much with reference to the prophetic word as to the fixed legislation of the Pentateuch, so that the whole narrative might be made to teach that the glory of Israel lies in the observance of the divine law and ritual. For the sake of systematic completeness, the author of the C. begins with Adam; but he had nothing to add to the Pentateuch, and the period from Moses to David contained little that served his purpose. He therefore contracted the early history into a series of genealogies, which were by no means the least interesting part of his work at a time when every Israelite was concerned to prove the purity of his Hebrew descent. From the death of Saul the history becomes fuller, and runs parallel with the books of Samuel and Kings. The limitations of the author's interest in past times appear in the omission, among other particulars, of David's reign in Hebron, of the disorders in his family and the revolt of Absalom, of the circumstances of Solomon's accession, and of many details as to the wisdom and splendor of that sovereign, as well as of his fall into idolatry. In the latter history the ten tribes are quite neglected, and political affairs in Judah receive attention, not in proportion to their intrinsic importance, but according as they serve to exemplify God's help to the obedient and his chastisement of the rebellious. That the author is always unwilling to speak of the misfortunes of good rulers, is not to be ascribed to a desire to suppress the truth, but shows that the book was throughout composed not in purely historical interest, but with a view to inculcate a practical lesson. The more important additions which the chronicler makes to the old narrative consist partly of full details of points connected with the history of the sanctuary and the great feasts, or the archæology of the Levitical ministry, and partly of narratives of victories and defeats, of sins and punishments, of obedience and its reward, which could be made to point a plain religious lesson in favor of faithful observance of the law. The minor variations of C. from the books of Samuel and Kings are analogous to the larger additions and omissions, so that the whole work has a consistent and well-marked character, presenting the history in quite a different perspective from that of the old narrative. An immense amount of criticism has been expended upon C.; but after all it is safe to conclude, with Ewald and other careful critics, that there is no foundation for the charge that the chronicler invented history in the interest of his practical purpose of exhortation and encouragement. But it is not to be doubted that in shaping his narrative he allowed himself the same freedom taken by other ancient historians, and even by copyists. [Portions of this article are, with modifications, from *Encyclopædia Britannica*, ninth edition.]

CHRO'NOGRAM, or CHRO'NOGRAPH (Gr. *chronos*, time, and *gramma*, a letter, or *grapho*, I write), a whimsical device of the later Romans, resuscitated during the *renaissance* period, by which a date is given by selecting certain letters amongst those which form an inscription, and printing them larger than the others. The principle will be understood from the following C., made from the name of George Villiers, first duke of Buckingham.

GEORGIVS. DVX. BVCKINGAMIÆ.

The date MDCXVVVIII (1628) is that of the year in which the duke was murdered by Felton, at Portsmouth.

CHRO'NOGRAPH. Different forms of time-measures, or time-recorders, under this designation, have been invented within a recent period.

Benson's chronograph is intended to measure intervals of time down to tenths of a

second, for use at horse-races and other occasions where a seconds watch is not exactly suited. It has an ordinary quick train-lever movement, carrying hands which move over a dial. One of these is a seconds hand, very peculiarly made. The seconds hand is double, consisting of two distinct hands, one superposed on the other. The outer end of the lowermost hand has a small cup with a minute hole at the bottom; while the corresponding end of the uppermost hand is bent over so as exactly to reach this puncture. The little cup is filled with ink, having a consistency between that of writing-fluid and printers' ink. Suppose that a horse-race is about to take place. The observer keeps a steady look-out for the fall of the starter's flag, or whatever the signal may be: he gives a pull to a cord or string connected with the mechanism peculiar to the instrument; by this movement, the outer and bent end of the upper seconds hand dips down through the ink-cup in the lower hand, and through the puncture to the dial. A small black spot or mark is thus made upon the dial-plate; and this is repeated as each horse passes the winning-post. If the eye and hand of the operator are quick and accurate, there is a reliable record thus presented by the instrument of the duration of the race, sometimes as close as one tenth of a second. The instrument is now adopted at the principal races as a suitable one for the purpose; thus it is used for races such as the Derby, the Oaks, the Goodwood, the St. Leger, etc. It is also available for many other purposes.

Strange's chronograph is designed for a more scientific purpose, and constructed with more careful details. The object is to measure extremely short intervals of time, for the determination of longitudes in great trigonometrical surveys. The observer, when a particular star traverses the field of his telescope, touches a small ivory key; and on the instant, a dot or mark appears on a sheet of paper coiled round a barrel. The instrument being connected with an astronomical clock, there is a dot made for every beat of the pendulum; and as these dots are a considerable space apart (considerable, that is, for the refined instruments of the present day), it is possible to determine so wonderfully minute an interval as one hundredth of a second.

Other forms of chronograph have been adopted by astronomers. One was suggested by prof. C. A. Young in 1866 to assume the functions of a *recording* chronograph, by marking the instant of observation in hours, minutes, seconds, and hundredths of a second, in *printed* characters, and in a form suitable for preservation and reduction.

Chronographs connected with electric and magnetic apparatus are used for determining the velocity of projectiles. Many forms have been devised by Noble, Bashforth, Navez, Le Boulengé, and other inventors. The most general arrangement consists in causing the bullet to pass through a series of screens; the rupture of each screen breaks for a moment the continuity of an electric current, sets in action an electro-magnetic apparatus, and makes a permanent mark or record.

CHRONOL'OGY is the science of the divisions of time. It has two main branches—mathematical C., and historical chronology. Mathematical C. is engaged with such of the units for the measurement of time as begin and end with the period of complete evolution of recurring celestial phenomena. See articles CALENDAR, YEAR, MONTH, DAY, and CYCLE, where the chief points in mathematical C. are explained. Historical C. uses these units among others to measure the distance in point of time between events, and to fix their *dates*. As in geography and navigation, longitude is measured from some arbitrary line, such as the meridian through Greenwich, so in historical C., *dates* are fixed by giving their distance from some arbitrary point of time, usually chosen because of some remarkable occurrence which signalized it. Such a fixed point, or *epoch*, forms the beginning of an *era*. It is thus that *dates* have been aptly said to be to events in history what the latitude and longitude of places are to the places in geography and navigation. The mathematical, or, to speak more properly, the astronomical units of time above referred to have not been, as has been already hinted, the only units used in historical chronology. In early times, the more accurate methods of mathematics were unknown, and such vague periods as "a generation," or the lifetime of leading persons in a nation, such as the priestesses of Juno, or of the kings, were assumed as units in historical chronology. The great variety of eras, too, in ancient times confuses the student of chronology. Thus the era of the Greeks began with the year of the first olympiad, or that in which Corœbus was victor; being the first celebration of the games at which the victor's name was recorded, and which is calculated to correspond to the year 776 B.C. From this epoch, the Greeks measured time by olympiads or periods of four years. Thus, the 3d year of the 12th olympiad would be the year 729 B.C. The Roman era was reckoned from the founding of the city, being either 752 or 753 B.C. The Roman practice of dating events from the building of the city, seems to be the first instance of the method of reckoning time from a fixed point by single years. It thus forms one of the great stages in chronology. Of other eras we shall merely mention the Mohammedan, which commences with the flight of Mohammed, 622 A.D., and which is called the *Hedjrah* (q.v.). The Roman and Greek methods of measuring time continued to be in use long after the birth of Christ; the olympiads, indeed, appear to have been employed in Europe down to the 304th olympiad, or 440 A.D. From 312 A.D., however, the public mode of computation throughout the Roman empire was by indictions, which were periods of 15 years, beginning with that year (see INDICTION); and this mode was at one time

almost universally followed in the west. In France, it was not altogether discontinued till the end of the 15th century. The Christian era is said to have been first proposed in the year 527 A.D., and is now universally used in Christendom. Part of the business of C. is to determine the relationships of the different eras, so as to enable one to express, in the language appropriate to one mode of computation, the date of an event recorded in another. Owing to the birth of Christ being a comparatively recent event, the Christian era is attended by this inconvenience, that we must count backwards from it for the dates of occurrences prior to it. To obviate this, various comprehensive periods, such as the Julian and Louisian periods have been invented, which have the merit of being applicable to most events lying within the limits of history. See PERIOD.

Various systems of C., such as the Chinese, Babylonian, Egyptian, Indian, and Chaldean, are worthy of attention. Accounts of the periods which these nations respectively assign to their histories, will be found under the heads CHINESE EMPIRE, BABYLON, etc. Of *sacred C.* there have been various systems. In these the epochs are the creation of the world, and the flood; but the chief copies of the Bible do not agree as to the dates of these events. While the Hebrew text reckons 4,000 years from the creation to the birth of Christ, and to the flood 1656 years, the Samaritan makes the former much longer, though it counts from the creation to the flood only 1307 years. The Septuagint version differs from both. It removes the creation of the world to 6,000 years before Christ, and 2,250 years before the flood. These differences have never been reconciled. It is, now, however, universally admitted, that the creation of the world is not to be regarded as having occurred even so recently as 6,000 B.C. The modern understanding of the first chapter of Genesis leaves the period of the creation quite indefinite, and one scheme of interpretation stretches out the days of creation into periods of indefinite length. Of the *Newtonian C.*, all that can be said here is, that it was an attempt, now generally admitted not to have been very successful, to rectify the obvious blunders of ancient chronologers, by determining certain epochs by means partly of astronomical calculations, and partly of the critical examination of such chronicles as measured time by reigns and generations. By a very fine argument, the soundness of which has since been doubted, Newton set down the date of the Argonautic expedition as being 43 years after the death of Solomon, or 937 B.C.

CHRONOL'OGY (*ante*), as to many periods is largely conjectural. The Christian era (q.v.) starts at the birth of Christ. The years before are marked B.C. and those after, A.D. (Anno Domini). This era is now almost universally accepted. The olympiad was a Greek era in periods of five years; the birth of Christ occurred in the middle of the fourth (some say in the second or third) year of the 194th Olympiad. The era of the foundation of Rome is usually assigned to 753 B.C. The era of the creation is fixed at many widely varying points. The reckoning of Constantinople, which is still used by the Greek church, makes it 5509 B.C.; the Abyssinian church, 5492; the Alexandrian church, 5502, and later 5492; the Jews, 3761. One writer on the C. of sacred history collected more than 200 different estimates of the era of the creation, the shortest being 3483, and the longest 6984 B.C. If such or such a date from the creation means anything, it is probably to be read by the period fixed by Dr. Usher, which was 4004 B.C. Yet it must be understood that, on this point, we are without the data for an accurate and positive chronology. There is an era of the creation used in India, which is only 3102 B.C. The era of Vicramyditya in common use in India begins 56 B.C. The Spanish era, dating from the conquest of Spain by Augustus, 38 B.C., was in use in Spain, Portugal, North Africa, and Southern France. The era of Diocletian, or of the martyrs, is dated 284 A.D. The Mohammedan era, beginning at the time of the prophet's flight to Medina, is 622 A.D. As reckoned by our ordinary C., the precise dates of commencing the above and other eras are:

Grecian, Mundane	Sept. 1,	5598	B.C.
Constantinople, Civil	Sept. 1,	5508	"
Alexandrian	Aug. 29,	5502	"
Antioch, Mundane	Sept. 1,	5492	"
Julian Period	Jan. 1,	4713	"
Mundane, Usher	Oct.	4004	"
Mundane, Jewish	Oct.	3761	"
Abraham	Oct. 1,	2015	"
Olympiads	July 1,	776	"
Rome, foundation of	April 24,	753	"
Nabonassar	Feb. 26,	747	"
Metonic Cycle	July 15,	432	"
Macedonian, or Grecian	Sept. 1,	312	"
Tyrian	Oct. 19,	126	"
Sidonian	Oct.	110	"
Cæsarian, of Antioch	Sept. 1,	48	"
Julian Year	Jan. 1,	45	"
Spanish Era	Jan. 1,	38	"
Actian	Jan. 1,	30	"
Augustan	Feb. 14,	27	"

Usual Christian (ours)	Jan. 1,	1	B.C.
Destruction of Jerusalem	Sept. 1,	69	A.D.
Era of Maccabees	Nov. 24,	166	"
Era of Diocletian	Aug. 29,	284	"
Era of Ascension	Nov. 12,	295	"
Armenian	July 9,	552	"
Mohammedan, Hegira	July 16,	622	"
Persian of Yezdegird	June 16,	632	"

CHRONOM'ETER, or time-measurer, is the name given principally to such time-keepers as are used for determining the longitude at sea. The mechanism is essentially the same as that of a common watch; only the size is generally greater, and additional precautions are taken to secure regularity under changes of temperature and other deranging influences. See HOROLOGY.

CHRON'OSCOPE, an instrument contrived by sir Charles Wheatstone to measure the duration of certain short-lived luminous phenomena, such as the electric spark, of which the eye itself can be no judge, owing to the persistence of impressions of light on the eye after the cause of sensation has ceased. The phenomenon is observed by reflection in a mirror, in such rapid motion that the image of the luminous object would appear to describe a circle, supposing the luminosity to endure long enough. Should the phenomenon be instantaneous, the image will appear as a mere point; should it last for an appreciable time, the image will form an arc, greater or less, of the circle. The electric spark is found by this test to have no duration.

CHRU'DIM, a t. of Bohemia, beautifully situated on a small river, about 62 m. s.e. of Prague. It is walled, has a noble collegiate church, a high school and Capuchin convent, manufactures of cloth, and very important horse-markets. Pop. '69, 11,218.

CHRYS'ALIS, or CHRYS'ALID, a name originally Greek, and strictly belonging to those *pupæ* of butterflies which are adorned with golden spots, but extended to the pupæ of lepidopterous insects generally, and even of other orders of insects. The chrysalids of lepidopterous insects are inclosed in a somewhat horny membranous case; sometimes very angular, sometimes nearly round; generally pointed at the abdominal end, sometimes at both ends; and before the caterpillar undergoes its transformation into this state, it often spins for itself a silken cocoon, with which earth and other foreign substances are sometimes mixed, so as to increase its size, and within which the chrysalid is concealed. Chrysalids are often suspended by cords, and generally remain nearly at rest; some have the power of burying themselves in the earth; others are bound by a single silken thread which passes round their middle some twirl themselves round when touched, or when the stalk or leaf to which they are suspended is touched; and in general, they give signs of life, when disturbed, by violent contortions of the abdominal part. See INSECTS; PUPA; LEPIDOPTERA; BUTTERFLY, HAWK-MOTH, MOTH, and SILKWORM.

CHRYSAN'THEMUM (Gr. gold-flower), a genus of plants of the natural order *compositæ*, sub-order *corymbiferæ;* having a hemispherical or nearly flat involucre, with imbricated scales, which are membranous at the margin, a naked receptacle, the florets of the disk tubular and hermaphrodite, those of the ray strap-shaped and female, the fruit destitute of pappus. The species of this genus are annuals, perennials, or shrubby; and all have leafy stems. They are natives chiefly of the temperate parts of the old world. *C. leucanthemum*, the OX-EYE, or OX-EYE DAISY, is abundant in fields, meadows, and grassy places of woods, in most parts of Europe. It has large flowers, with white ray and yellow disk. It is often a troublesome weed among hay and in pastures; being perennial, and having a creeping brittle root-stock, it is not easily extirpated. It is common in Britain, which has only one other native species, *C. segetum*, CORN MARIGOLD, a frequent weed in cornfields—although rare in the neighborhood of Edinburgh—an annual, with large deep yellow flowers. It is dealt with like annual weeds in general, by pulling it up when young.—*C. carinatum*, an annual species with white ray and dark-red disk, the scales of the involucre keeled, a native of Barbary, is frequently cultivated in green-houses or—where the climate permits—in flower-gardens. The favorite species of the gardener is, however, *C. Indicum*, the CHINESE or INDIAN C., a native of China, Cochin-China, and Japan; which has long been cultivated in its native countries as an ornamental plant, and of which there are many varieties. Its colors are also very various—red, lilac, rose-color, white, yellow, orange, or two colors combined. It flowers in autumn and winter. It is easy of cultivation, succeeds best in a light rich soil, is easily propagated by cuttings, suckers, or parting the roots, but requires the greenhouse in Britain. It was introduced in 1789. It is reckoned among florists' flowers.

CHRYSE. See page 897.

CHRYSELEPHANT'INE (Gr., from *chrysos*, gold, and *elephas* ivory), the art of making images of gold and ivory, was extensively practiced amongst the Greeks. Winckelmann has calculated that about 100 statues of this kind are mentioned by the ancients. The colossal works executed by Phidias at Athens, in the time of Pericles, are the most famous of this class, the greatest being the Pallas of the Parthenon. It was 26 cubits high, and represented the goddess in armor, covered with a long robe. The famous Olympian Jupiter of Phidias, executed in the same materials, was also a world-wide

wonder. The combination of gold and ivory was chiefly used in temple statues; and though the execution of the more famous works of this class belongs to an advanced period of art, the use of various materials in the same statue was very ancient, and probably borrowed from the custom of adorning the wooden images of the earliest time with the precious metals. Sometimes, too, the head, the arms and hands, and the feet were of marble, whilst the rest was of wood, covered with thin plates of gold. These were called acrolites (*akrolithoi*). See STATUARY.

CHRYSIP'PUS, an eminent Stoic philosopher, was b. about 280 B.C., at Soli in Cilicia. He came to Athens when still a youth, and eagerly addicted himself to philosophical pursuits. His principal master was Cleanthes, although he is said to have also studied under the academic teachers, Arcesilaus and Lacydes, and learned from them what were the objections urged by skeptics against the doctrines of the Stoics. He had the reputation of being the keenest disputant of his age, and was happily described as "the knife for the academic knots." In fact, his logic was held to be so convincing, that people were wont to say: "If the gods make use of dialectic, it can only be that of Chrysippus." It is also related of him, that he told Cleanthes he merely wanted to know the principles of his system, as he intended to find arguments for them himself; and this story appears to indicate his true position in philosophy. He was not the creator of a new system, but the expounder of an old. C.'s industry was very great. He seldom wrote less than 500 lines a day, and is said to have composed more than 700 works. Many of these, however, were compilations, and were not characterized by great beauty of style. Only a variety of fragments remain, which have been edited by Petersen (*Philosophiæ Chrysippeæ Fundamenta*, Altona and Hamburg, 1827).

CHRYS'IS, a Linnæan genus of hymenopterous insects, now constituting a family *chrysidæ*, allied to the *ichneumonidæ*, and forming a connecting-link between them and bees, wasps, etc. The French call them *Guêpes dorées* (gilded wasps), and they sometimes receive the English names of *golden-tailed* and *ruby-tailed flies*. They delight in sunshine, and may be seen poised in the air—the motion of their wings being so rapid as to render the body alone of the insect visible.

CHRYSOBALANA'CEÆ, or CHRYSOBALANEÆ, according to some botanists, a distinct natural order of plants; according to others, a sub-order of rosaceæ (q.v.). They are distinguished from the other plants usually included in the order rosaceæ by their irregular petals, and by having the stamens also irregular, either in size or position; the ovary stalked, its stalk adhering on one side to the calyx, the style proceeding from its base. The fruit is a drupe of one or two cells. The species are trees or shrubs, natives generally of tropical and sub-tropical regions. About 50 species are known. The fruit of many is eatable, as the cocoa plums (q.v.) of the West Indies (*chrysobalanus*), the fruit of *parinarium excelsum* in Sierra Leone, and that of *moquilea grandiflora* in Brazil. The kernels of some resemble sweet almonds, as those of *parinarium campestre* and *P. montanum*. A useful oil is expressed from the seeds of *prinsepia utilis*, a spiny plant, common in some parts of the Himalaya mountains, and which is also planted for hedges in the Khasia hills, at an elevation of 5,725 ft. above the sea; whilst in Sikkim it is only found where the elevation is above 8,000 feet. This plant would in all probability succeed well in Britain, and an attempt should certainly be made to introduce it.

CHRYSOBERYL, a gem almost as hard as sapphire, and the finer specimens of which are very beautiful, particularly those which exhibit an opalescent play of light. Lapidaries sometimes call it oriental or opalescent chrysolite. It is of a green color, inclining to yellow, semi-transparent, or almost transparent, and has double refraction. It occurs crystallized in six-sided prisms; often in macles, or twin crystals. It is found in granite, in sandstone, and in alluvial soil; in Ceylon, Pegu, Siberia, Brazil, and Connecticut. It is composed of alumina, glucina, and a little protoxide of iron; the alumina being about 80 per cent of the whole.

CHRYS'OCOLLA, or COPPER-GREEN (Gr. gold-glue), an ore of copper, found in Cornwall and in many parts of the world, but particularly in Wisconsin and Missouri, where it is so abundant as to be worked for copper. As a pigment, it was much used by the ancients.

CHRYS'OLITE (Gr. golden-stone), a mineral composed of silica, magnesia, and protoxide of iron; of a fine green color, with vitreous luster; transparent, and having double refraction; in hardness, about equal to quartz; and with conchoidal fracture. It often crystallizes in four-sided or six-sided prisms, variously modified. Very fine specimens are brought from Egypt and from some parts of the east, also from Brazil. C. is used by jewelers as an ornamental stone, but is not highly valued. *Olivine*, which occurs generally massive, in grains and roundish pieces, and is frequent in volcanic countries, and found in the igneous rocks of some parts of Scotland—as on Arthur's seat—is regarded as a coarse variety of chrysolite.—The chrysoberyl (q.v.) is sometimes called C. by jewelers.

CHRYSOLO'RAS, MANUEL, a learned Greek of Constantinople, was b. in the middle of the 14th century. He is regarded as the first who transplanted Greek literature into Italy. About the year 1391, the Byzantine emperor, John Palæologus, sent C. to England and Italy to entreat assistance against the Turks. This mission made C. known

in Italy, and, in 1397, he left his native land and went to Florence, where, as teacher of Greek literature, he was highly esteemed and admired. Leonardo Bruno, Poggius, Philelphus, Guarinus of Verona, and other eminent scholars, were pupils of his. He was afterwards employed in public services—especially in mediating a union of the Greek with the Roman church—by pope Gregory XII. In 1413, C. went with John XXII. to the council of Constance, where he died 1415. Besides theological works, his *Erotemata*, or "Accidence of the Greek Language" (Venice, 1484), has been preserved. Manuel C. must be distinguished from his nephew, JOHN CHRYSOLORAS, who also went to Italy and gave lessons in Greek.

CHRYSOMELA and CHRYSOMELINÆ. See GODLEN BEETLE.

CHRYSOPHYLLUM. See SAPOTACEÆ, MONESIA BARK, and STAR APPLE.

CHRYS'OPRASE is merely a variety of chalcedony, but is valued far above common chalcedony as an ornamental stone; so that a stone of this kind, fit for mounting in a ring, is worth from £10 to £20. It is of a fine apple-green color in choice specimens, but inferior ones exhibit other shades of green, and it is sometimes spotted with yellowish-brown. It is often set in a circlet of diamonds or pearls. Unfortunately, it is apt to lose its color through time, particularly if kept in a warm place; but dampness is favorable to its preservation, and it is therefore sometimes kept in damp cotton. It is found in lower Silesia—where the search for it was particularly encouraged by Frederick the great—and in Vermont. The inferior specimens are made into brooches, necklaces, etc.; and those still coarser, into snuff-boxes, seals, cups, etc.—The C. of the ancients was a stone of yellowish-green color, but it is not certain what it was.

CHRYS'OPS. See CLEG.

CHRYS'OSTOM, JOHN (Gr. *Chrysostomos*, golden-mouth; so named from the splendor of his eloquence), was b. at Antioch in 347 A.D. His mother Anthusa was a pious woman, wholly devoted to her son, who grew up under her loving instructions into an earnest, gentle, and serious youth, passing through, as Neander significantly observes, none of those wild, dark struggles with sinful passions which left an ineffaceable impress on the soul of Augustine, and gave a somber coloring to his whole theology. He studied oratory under Libanius, a heathen rhetorician; soon excelled his teacher; and, after deyoting some time to the study of philosophy, retired to a solitary place in Syria, and there read the Holy Scriptures. The ascetic severity of his life and studies brought on an illness which forced him to return to Antioch, where he was ordained deacon by bishop Meletius in 381, and presbyter by bishop Flavianus in 386. The eloquence, earnestness, and practical tone of his preaching excited the attention of Jews, heathens, and heretics, and secured for him the reputation of the chief orator of the eastern church. In 397, the eunuch Eutropius, minister of the emperor Arcadius, who had been struck by the bold and brilliant preaching of C., elevated him to the episcopate of Constantinople. C. immediately began to restrict the episcopal expenditure in which his predecessors had indulged, and bestowed so large a portion of his revenues on hospitals and other charities, that he gained the surname of "John the Almoner." He also endeavored to reform the lives of the clergy, and sent missionaries into Scythia, Persia, Palestine, and other lands. His faithful discharge of his duties, especially in reproof of vices, excited the enmity of the patriarch Theophilus and of the empress Eudoxia, who succeeded in deposing and banishing him from the capital. He was soon recalled, to be banished again shortly afterwards. He now went to Nicæa, in Bithynia; but was from thence removed to the little town of Cucusus, in the desert parts of the Taurus mountains. Even here his zeal was not abated. He labored for the conversion of the Persians and Goths in the neighborhood, and wrote the seventeen letters (or rather moral essays) to Olympias, to whom he also addressed a treatise on the proposition—"None can hurt the man who will not hurt himself." The emperor, enraged by the general sympathy expressed towards C. by all true Christians, gave orders that he should be more remotely banished to a desolate tract on the Euxine, at the very verge of the eastern Roman empire. Accordingly, the old man was made to travel on foot, and with his bare head exposed to a burning sun. This cruelty proved fatal. C. died on the way at Comanum, in Pontus, Sept. 14, 407 A.D., blessing God with his dying lips. The news of his death excited much sorrow among all pious Christians, for C. was a man who drew the hearts of his fellows after him; a lovable, manly Christian, hating lies, worldliness, hypocrisy, and all manner of untruthfulness, with that honest warmth of temper which all vigorous people relish. A sect sprang up after his death, or martyrdom as they conceived it, called *Johannists*, who refused to acknowledge his successors; nor did they return to the general communion till 438, when the archbishop Proclus prevailed on the emperor Theodosius II. to bring back the body of the saint to Constantinople, where it was solemnly interred, the emperor himself publicly imploring the pardon of heaven for the crime of his parents, Arcadius and Eudoxia. The Greek church celebrates the festival of C. on the 13th of Nov.; the Roman, on the 27th of January. In his *Homilies* (Thomas Aquinas said he would not give in exchange those on St. Matthew for the whole city of Paris) C. displays superior powers of exegesis. In general, he rejects the allegorical system of interpretation, and adheres to the grammatical, basing his doctrines and sentiments on a rational apprehension of the letter of Scripture. He is, however, far from being a bibliolater. He recognized the presence of a human element in the Bible as

well as a divine; and instead of attempting, by forced and artificial hypotheses, to reconcile what he thought irreconcilable in Scripture statements, he frankly admitted the existence of contradictions, and shaped his theory of inspiration accordingly. But his greatest and noblest excellence lay in that power, springing from the fervor and holiness of his heart, by which the consciences of the proud, the worldly, and the profligate were awakened, and all were made to feel the reality of the gospel message. The surname C. was first applied some time after his death, and, as it is supposed, by the sixth œcumenical council in 680. C.'s works are very numerous, and consist of, 1st, *Homilies*, on parts of Scripture and points of doctrine; 2d, *Commentaries*, on the whole Bible (part of which has perished); 3d, *Epistles*, addressed to various people; 4th, *Treatises*, on different subjects (such as Providence, the Priesthood, etc.); and 5th, *Liturgies*. Of these the most valuable, as well as the most studied, are the *Homilies*, which are held to be superior to everything of the kind in ancient Christian literature.

The most correct Greek edition of C.'s works is that by Henry Savil (8 vols., Eton, 1613); and the most complete Greek and Latin edition is that by Montfaucon (13 vols., Par. 1718–38; republished in 1834–40). The best authority in regard to C. is Neander, who, besides treating of his life and labors in his *Kirchengeschichte*, published a life of this eminent father.

CHRYS'OTYPE (Gr. *chrysos*, gold; *typos*, impression), a photographic process invented by sir John Herschel, and depending for its success on the reduction of a persalt of iron to the state of protosalt by the action of light, and the subsequent precipitation of metallic gold upon this protosalt of iron. The process is conducted as follows: Good paper is immersed in a solution of ammonio-citrate of iron of such a strength as to dry into a good yellow color, without any tinge of brown in it. It is then exposed to light under a negative until a faint impression is obtained. A neutral solution of chloride of gold is then brushed over the paper, when the picture immediately appears, and is rapidly developed to a purple tint. It should then be freely washed in several changes of water, fixed with a weak solution of iodide of potassium, again thoroughly washed and dried. The action of the iodide of potassium is to convert any unaltered chloride of gold into a soluble double iodide of gold and potassium, thus rendering the picture permanent.

CHRZANOW'SKI, Adalbert, 1788–1861; a native of Poland, who participated in Napoleon's Russian campaign, in the engagements at Leipsic, Paris, and Waterloo. After Napoleon's final defeat he served in the Russo-Polish army, and was under Diebitsch in Turkey in 1829. In the Polish revolution of 1830 he served with distinction, rose to the rank of gen. of division, and was made governor of Warsaw. He fell under suspicion of friendliness to the Russians, and was from time to time under a sort of ostracism. In 1849, he was chosen by Charles Albert commander-in-chief of the Sardinian forces in the short-lived revolution of that period. Ramorino and C. were charged with treachery, and the former was put to death. Some years later C. emigrated to the United States, and died in Louisiana.

CHUB, *Leuciscus cephalus*, a fish of the family *cyprinidæ*, of the same genus with the roach, dace, bleak, minnow, etc. See Leuciscus. The color is bluish-black on the upper parts, passing into silvery white on the belly; the cheeks and gill-covers rich golden yellow. The C. rarely attains a weight exceeding 5 lbs. It is plentiful in many of the rivers of England, and occurs in some of those of the s.w. of Scotland. In the rivers of Cumberland it bears the name of *skelly*, supposed to have reference to the size of its scales; but the schelly of Ullswater lake is the gwyniad, and the C. is there called the *chevin*. It is found in many rivers of the continent of Europe; being the *jentling* or *bratfisch* of the Danube, and the *jese* of the Oder. It spawns in April and May. It is not in great esteem for the table.

The C. rises well at a fly, and takes freely a variety of baits. The same baits and the same means of fishing may be employed as for the barbel and bream. The C. is very fond, moreover, of slugs, grasshoppers, cockchafers, and humble-bees. The latter two are to be used either naturally, by means ofdibbing or dapping, or, being imitated, may be used artificially, and cast as a fly. The best flies for the C. are large red, black, and brown palmers, with the hackles laid on thickly. The best places to fly-fish for C. are close under overhanging boughs at the sides of streams, or against piles, or other places where they can get some shelter, for the C. is somewhat shy and easily alarmed. He is a bold riser, and when he comes at a fly seldom fails to hook himself. Of all the baits for bottom-fishing, he prefers greaves, cheese, and worms; and the fatter the bait the better he likes it. He will occasionally run at a minnow, and is often taken on a spinning bait. The C. spawns in May and comes into condition again by the end of June or early in July; bites best, and is in the best condition for bottom-fishing, in Oct. and Nov. When first hooked, he makes a great dash, but he very soon gives in. Some years ago, the scales of the C. were in much at repuest, in common with those of the bleak, for artificial pearl-makers.

CHUBB, Thomas, an English rationalist, who wrote on religious questions during the first half of the last century, was b. at East Harnham, in Wiltshire, in 1679. He received but a meager education in youth, and, after an apprenticeship to a leather glove and breeches maker in Salisbury, he became a tallow-chandler, in which business he con-

tinued to the end of his life. His first work, published in 1715, was entitled *Supremacy of God the Father Vindicated.* Besides this, he wrote a multitude of treatises on other religious subjects. Among these may be mentioned: *A Discourse on Reason, as a sufficient Guide in matters of Religion; On Sincerity; On Future Judgment and Eternal Punishment; Inquiry about Inspiration of the New Testament;* and *Doctrine of Vicarious Suffering and Intercession Refuted.* C. died in 1746.

CHUCK-WILL'S-WIDOW, *Antrostomus Carolinensis,* a bird of the goatsucker family (*caprimulgidæ*), a native of the southern parts of the United States. It has received its singular name from its note, which resembles these words or syllables articulated with great distinctness, and is repeated like that of the cuckoo, or of its own congener, the whip-poor-will (q.v.).

CHUCUI'TO, or CHUQUITO, a t. of Bolivia, in the department of Puno, and 100 m. e.n.e. of Arequipa, on the w. shore of lake Titicaca, at the mouth of a stream flowing from the Andes. It was formerly of much greater size and importance than it is at present, having had, it is said, at the beginning of the 18th c., the incredible number of 300,000 inhabitants. Its present pop. is only about 5,000. In the province of the same name, of which it is the capital, there are mines of silver and gold, and interesting antiquarian remains.

CHU-LAN. See CHLORANTHACEÆ.

CHUMBUL', a river rising in the Vindhyan mountains, which form the southern limit of the basin of the Ganges. Its source, at a height of 2,019 ft. above the sea, is in lat. 22° 26′ n., and long. 75° 45′ east. During a generally n.e. course of 570 m., it receives many tributaries on both sides, till, in lat. 26° 30′ n., and long. 79° 19′ e., it enters the Jumna from the right, with such a volume of water, that, when itself flooded, it has been known to raise the united stream 7 or 8 ft. in twelve hours. The C. is remarkable, here and there, for the wildness of its current and the picturesque character of its banks.

CHUNAM', the Indian name for a very fine kind of quicklime made from calcined shells or from very pure limestone, and used for chewing with betel (q.v.), and for plaster. Both recent and fossil shells are used for making chunam. Extensive beds of fossil shells employed for this purpose occur in the s. of India, particularly in low marshy situations near the sea-coast. The shells used are in the first place very carefully cleaned; they are then calcined in kilns, with wood charcoal. When chunam is to be used for plaster, it is mixed with fine river-sand, and thoroughly beaten up with water. A little *jaggery* (coarse sugar) is also added. When very beautiful work is desired, three coats of chunam are given to the wall, and the result is a plaster almost equal to marble in its polish and beauty. The third coat is applied in the form of a very fine paste, consisting of four parts of lime and one of fine white sand, beaten up with whites of eggs, sour-milk, and *ghee* (butter). After it has been rubbed on with a wooden rubber, the surface is washed with a cream of pure lime, and is rubbed with a polished piece of quartz or rock crystal. During this process, the wall is sprinkled with powder of pot-stone, and the rubbing is continued until the wall is quite dry, every trace of moisture being finally removed by a cloth. Chunam is an important article of trade in India.

CHUNARGURH', or CHUNAR, a fortified t. on the right bank of the Ganges, 16 m. to the s.w. of Benares, and in the division of that name. It is in the district of Mirzapore, and lieutenant-governorship of the north-west provinces. The population of the town in 1871 amounted to 10,154. The fortress, which occupies the summit of a sandstone rock, contains the commandant's house, the hospital, the prison, and an ancient palace, with a deeply excavated well of indifferent water. The river in front is navigable at all seasons for vessels of from 50 to 60 tons.

CHUND, or CHAND, a Hindu writer of the 12th c., court poet to the last of the Hindu sovereigns of Delhi. He wrote in verse an immense encyclopædic work, including a history, and especially an account of the exploits of the author and of his master.

CHUPRA, a t. in India, in the province of Behar, Bengal, on the n. bank of the Ganges, 35 m. n.w. of Patna. It extends nearly a mile along the river, and has several pagodas, mosques, and churches. There is trade in cotton, sugar, and saltpeter. Pop. about 30,000.

CHUQUISA'CA, or SU'CRÉ, the capital of Bolivia or Upper Peru, in lat. 19° 20′ s., and long. 65° 30′ west. It is situated on a table-land about 9,000 ft. above the sea, and has a pleasant climate. The town is well built, has a cathedral of great magnificence, a university, a college of arts and sciences, and a mining-school. C. was founded in 1538 by Pedro Auzures, an officer of Pizarro's, on the site of an old Peruvian town called "Choque Chaka," or "bridge of gold," "the treasures of the Incas having passed through it on their way to Cuzco." At one time, C. bore the name of La-Plata, on account of the rich silver mines in its vicinity. Pop. 23,979. C. gives name to a territory containing 223,668 whites, besides many native Indians. It has five silver mines in operation; and in it are magnificent ruins of unknown origin. The second name is derived from the general who, in Dec., 1824, fought and won the last great battle for colonial independence at Ayacucho.

CHUR (Fr. *Coire*, anct. *Curia Rhætorum*), a t. of Switzerland, capital of the Grisons, in the valley of the Upper Rhine, in a fertile plain about 2000 ft. above the sea, and surrounded by high mountains, 60 m. s.e. of Zurich, on the Plessur, about a mile from its junction with the Rhine. It is of importance as standing on the great road to Italy by the Splügen and Bernardin passes, and thus possessing a considerable transit trade. C. stands on uneven ground, has narrow streets, and is divided into a high and low town. The bishop's palace, and the quarter around it, inhabited by the Roman Catholics, occupy the summit of an eminence, and are separated from the rest by walls and battlements, closed by double gates. In the same quarter stand the old cathedral. a round, arched, or Byzantine edifice, founded in the 8th c.; the church of St. Lucius or the *Dom*, a curious example of early pointed Gothic, including fragments of earlier buildings. It contains singular old carving, paintings, and statues, and also, it is said, the bones of St. Lucius, who was a British king. Behind the episcopal palace is a kind of ravine lined with vineyards. In the lower town there are also some very ancient buildings. Romansch is still spoken in the vicinity; a newspaper in this dialect is published in the town; and a considerable collection of Romansch literature is to be found in the library of the cantonal schools. There are several new roads leading in different directions through the Grisons; and a railway connects the town with Zurich and other places. There are manufactures of zinc wares and cutting tools. Pop. '70, 7,552, of whom about 2000 are Catholics.

CHURCH, a word which signifies either a place of Christian worship or a collective body of Christian people. It is, in all probability, derived from the Greek adjective *kyriakos* (from *kyrios*, lord), the place of worship having been called *the Lord's house*, and the worshipers *the Lord's people*. The Scottish *kirk*, the German *kirché*, etc., are merely different forms of it.

Under the terms apse and basilica (q.v.), we have already explained that the earliest ecclesiastical structures of the Christians were copied or adapted not from the heathen or Jewish temple, as might have been anticipated, but from that peculiar combination of a hall of justice and a market-place to which the name basilica was given by the ancients. The reason of this selection is probably to be found, not so much in the spirit of opposition which no doubt existed between Christians and heathens, as in the essentially different conceptions which they formed of the character and objects of public worship. The rites of heathendom were performed exclusively by the priest, the people remaining without the temple; and the temple itself, which was lighted only from the door, or by the few lamps which burned around the image of the god, was regarded not as a receptacle for worshipers, but as the abode of the deity. The dark, mysterious character which thus belonged to it, rendered it equally unsuitable for the performance of liturgical services in which the people were to participate, and for the delivery of those public addresses which from the beginning were employed as a means of Christian teaching and exhortation. To such purposes, the prætor's court-room, with its surroundings, were readily adapted, by the few simple alterations which we have described in the articles referred to. But the basilica, as thus altered, was a mere utilitarian structure. It served the purposes of Christian worship, but there was nothing in its form which responded to the feelings of Christian worshipers, or tended to awaken Christian sentiments. Now, the cross (q.v.) had been used by Christians from a very early period to indicate their allegiance to the author of their salvation and the object of their faith; and gradually it had become the distinctive emblem of Christianity. Nothing, then, could be more natural than that when it became desirable to give distinctively Christian characteristics to what hitherto had been a heathen structure, this should be effected by such a modification of its form as should convert it into a representation of this sacred emblem. Nor did this alteration lead to any very extensive change on the form of the C., as it had hitherto existed. The basilica, as we have already explained, not unfrequently had side entrances, either in place of, or in addition to, that from the end. All that was requisite, then, to convert the simple parallelogram of which it consisted into a cross, was, that at each side of the building these entrances, in place of direct communications with the exterior, should be converted into passages, or arms running out at right angles, and more or less prolonged, according as the object was to attain the form of a Greek or of a Latin cross (see Cross). If the C. was to be in the form of a Greek cross, the arms were made of the same length with the other two portions into which they divided the building; whereas if the cross was to be a Latin one, the portion of the building which ran towards the w. was made considerably longer than either of the others. In either case, the arms running at right angles to the C., and directly opposite to each other, cut it across, and thus obtained the name of *transepts*.

The external form of the C. being thus indicated, we now proceed to explain its internal arrangements, and to enumerate the various adjuncts which in cathedrals and others of the larger churches frequently sprang up around it.

Over the point at which the arms or transepts intersect the body of the cross, a central tower or spire is very frequently erected. From this central tower, or, if the tower or towers are situated elsewhere, from this central point, the portion of the building which runs westward, to where the Galilee or entrance chapel, or, in other instances, the

great entrance-door is situated, is called the nave (from *navis*, a ship), whilst the portion which runs eastward to where the altar, or high-altar, if there be several, is placed, is called the choir. In the larger and more complete churches, the nave, and frequently also the choir, are divided longitudinally by two rows of pillars into three portions, the portion at each side being generally somewhat narrower and less lofty than that in the center. These side portions are called the aisles of the nave, or of the choir, as the case may be. In some churches, the aisles are continued along the transepts, thus running round the whole C.; in others, there are double aisles to the nave, or to both nave and choir, or even to nave, choir, and transept. Behind, or to the e. of the choir, is situated the Ladye's chapel, or chapel of the Virgin, with sometimes a number of altars; and it is not unusual for side chapels to be placed at different places along the aisles. These usually contain the tombs of the founder, and of other benefactors to, or dignitaries connected with, the church. The extent to which these adjuncts exist depends on the size and importance of the C., and they are scarcely ever alike in two churches, either in number, form, or position. Vestries for the use of the priests and choristers generally exist in connection with the choir. Along the sides of the choir are ranged richly ornamented seats or stalls, usually of carved oak, surmounted with tracery, arches, and pinnacles; and amongst these seats, in the case of a bishop's church, the highest and most conspicuous is the so-called *cathedra*, or seat for the bishop, from which the cathedral takes its name. The larger English cathedral and abbey-churches have usually a chapter-house attached to them, which is of various forms, most commonly octagonal, and is often one of the richest and most beautiful portions of the whole edifice. On the continent, chapter-houses are not so common, the chapter (q.v.) being usually held in the cathedral itself, or in one of the chapels attached to it. Cloisters (q.v.) are also frequent, and not unusually the sides of those which are furthest removed from the C. or chapter-house, are inclosed by other buildings connected with the establishment, such as a library, and places of residence for some of the officials of the cathedral. It is here that, in Roman Catholic churches, the hall, dormitories, and kitchens for the monks are commonly placed. Beneath the C. there is frequently a crypt (q.v.). In some cathedral churches, the crypt is in reality a second underground C. of great size and beauty. The baptistery (q.v.) is another adjunct to the C., though frequently forming a building altogether detached. Most of the parts of the C. which we have mentioned may be traced; but it must not be supposed that their position is always that which is there represented. The position of the nave, choir, or chancel, aisles, and transepts are nearly invariable, but the other portions vary, and are scarcely alike in two churches.

Churches are of five classes—metropolitan, cathedral, collegiate, conventual, and parish churches—and of these the first are, generally speaking, the most, and the last the least elaborate. In ordinary language, any building set apart for religious ordinances is called a church, though when of a minor kind it is more usually designated a chapel. After a long period of neglect and poverty of taste, the building of churches in a superior style, emulative of the older styles of architecture, has greatly revived, not only as regards the church of England, but the church of Scotland and nearly all dissenting bodies.

As applied to a collective body of Christian people, the word C. is the translation and equivalent of the Greek word *ecclesia* (Lat. *ecclesia*, Fr. *église*), used in the New Testament. It is common among Protestants to distinguish between the *visible* and the *invisible* C.—the invisible C. consisting of all those who are savingly or spiritually united to Christ, that is, of all true believers; the visible C. consisting of all who profess the religion of Jesus Christ. Roman Catholics do not in the same manner acknowledge the distinction between the visible and the invisible C., but regard a connection with the hierarchy, and consequent participation of ordinances, as establishing a connection with the true C. and with Christ. Protestants regard the C. as subsisting from age to age, in virtue of the authority of Christ, and through the faith of individual believers and their confession of him; Roman Catholics regard the apostolical succession of the hierarchy, and the regular administration of the sacraments, as essential to the continued existence of that *Catholic* or universal C. which Christ planted on the earth, and the existence of which he has promised to maintain throughout all ages. Protestants, in general, regard the C. of Rome and the Greek C. as forming part of the visible C. of Christ; but Roman Catholics are not accustomed to make a corresponding admission with respect to the Protestant churches. From the hierarchical principle of the C. of Rome and of the Greek C., results an employment of the term C. to designate the hierarchy alone, which is contrary to the principles of the reformation, although a tendency to it may be observed in some Protestant churches. It has been usual for Protestants to designate by the term C. the collective body of Christians in a particular country, distinguished by the name of that country; the greater number of Protestants (Episcopalians and Presbyterians) believing that such a portion of the universal C. may warrantably be associated under a common government; and in countries where religious liberty exists, diversities of opinion on points of doctrine and C. government have given rise to the existence of separate Christian associations, distinguished by names generally indicative of some of the peculiarities which characterize them; but these, however much they may differ on many points, do not in general hesitate to recognize each other as belonging to the universal visible C. of

Christ, whilst they retain in common the same great first principles of the Christian faith, and particularly the belief in one God and in the three persons of the Godhead, the incarnation of the Son of God, the atonement by Jesus Christ, and the work of the Holy Spirit. The term C., however, is regarded by Independents (q.v.) or Congregationalists, as more strictly applicable to those who are united as worshipers in a particular place of worship, partaking of the Lord's supper together, and exercising discipline and C. government among themselves.

CHURCH, Albert E., ll.d., 1807–78; b. Conn.; graduated at West Point in 1828. He became professor of mathematics in the U. S. military academy in 1838, and published *Elements of Differential and Integral Calculus; Elements of Analytical Geometry; Elements of Analytical Trigonometry;* and *Elements of Descriptive Geometry, with its application to Spherical Projections, Shades and Shadows, Perspective and Geometric Projections.*

CHURCH, Benjamin, 1639–1718; a New England soldier who served with distinction in king Philip's wars, and was commander in the fight in which Philip was killed. He commanded a number of expeditions against the Indians of New Hampshire and Maine. From his dictation and memoranda his son wrote a history of king Philip's war.

CHURCH, Frederick Edwin, b. Conn., 1826; a pupil of Thomas Cole, and a painter of eminence. The works which gave him prominence are a "View of East Rock, near New Haven," and "Scenes in the Catskill Mountains." He visited South America in 1853 and 1857; and in Ecuador and New Granada made sketches for a number of paintings, some of which have attained great celebrity, such as the "Heart of the Andes," "On the Cordilleras," and "Cotopaxi." Another celebrated work is the "Horse-shoe Fall, Niagara." He visited Jamaica, and afterwards Europe and the Holy Land. Some of his other works are "Damascus," "Jerusalem," "The Parthenon," and "Tropical Scenery."

CHURCH, Frederick S. See page 897.

CHURCH, John Hubbard, d.d., 1772–1840; a graduate of Harvard in 1797, and for nearly 40 years pastor of a Congregational church in Pelham, N. H. He held various offices in Dartmouth college, Andover theological seminary, and Phillips academy, and was prominent in Bible, tract, and missionary societies.

CHURCH, sir Richard, 1780–1873; an Englishman, who held the principal command in the Greek war of independence. On the final establishment of the kingdom of Greece he was made a councilor of state, and afterwards a member of the senate; and was for many years at the head of the army and navy.

CHURCH, Sandford E., ll.d., 1815–80; b. N. Y.; bred to the law, in which he speedily rose to a prominent position. In 1850, he was elected lieut.gov. of New York, and was re-elected in 1852; in 1857, he was elected comptroller, but twice afterwards defeated for the same office. In 1870, he was elected chief justice of the court of appeals, which position he held until his death.

CHURCH, States of the. See Papal States.

CHURCH CALENDAR, a table of the order and series of days, weeks, months, and holy days in the year. The name is derived from *calendæ*, or first days of the Roman month. The earliest now existing which contains the Christian festivals is that of Silvius, 448 a.d. A fragment of a Gothic calendar remains, which probably belongs to the 4th century. The name is applied also to the *fasti* or catalogues for particular churches, of the saints most honored by them, such as bishops, martyrs, etc. At the reformation the German Lutheran church retained the Roman calendar. In 1850, a calendar was published for the evangelical church of Germany. It has been continued annually, and contains much interesting information, in addition to the table of feasts, fasts, etc. The full calendar of the church of England contains 9 columns, giving the golden number, days of the month, the dominical or Sunday letter, the calends, nodes and ides, the daily Scripture lessons, and the holy days of the church, together with some of the Roman festivals which have been retained, not as having any religious value, but because the practice of the courts, the habits of tradesmen, and the times of popular amusements had become interwoven with them. The calendar of the Protestant Episcopal church in the United States retains only the festivals which are referable to a Scriptural origin.

CHURCH CONGRESS, the name of free gatherings of ministers and laymen of the established church of England, annually convened for the discussion of ecclesiastical and religious questions. The first church congress was held in 1861 in Canterbury, and in the following years successively in Oxford, Manchester, Bristol, York, etc. The attendance is usually very large, and comprises many bishops and lower dignitaries. Full reports of the proceedings of each session are published. Such meetings, having the advantage of free interchange of views, but with no claim to ecclesiastical authority, have been found very profitable in this country; and though in the Protestant Episcopal church the sentiment in their favor has not been unanimous, they are winning for themselves an established position through either enthusiastic advocacy or silent consent.

CHURCH DIET, the free gathering of ministers and lay members of German Protestant churches. Such meetings arose in consequence of the revolutionary movements of 1848, which threatened to endanger the influence of the evangelical church upon society. Members of the Lutheran, Reformed, the United Evangelical, with the high church "confessionals" participated in the earlier meetings; but after 1860 only the evangelical parties were represented. Annual reports are published.

CHURCH DISCIPLINE, *Disciplina ecclesiastica,* includes all the means employed by the Christian church, besides the ministration of word and sacraments, to secure on the part of its office-bearers and members a faithful adherence to their profession and a corresponding blamelessness of life. It rests upon the authority of Christ, and at the same time necessarily arises, in some form of it, out of the very constitution of the church as a society. Among the early Christians, it soon assumed forms of great severity towards offenders, especially towards the *lapsed* (q.v.). At a later period, the discipline of the church was chiefly exercised with respect to persons accused of heresy and schism. The penances of the church of Rome have long formed an important part of its discipline, and therewith its *indulgences* (q.v.) are closely connected, as well as its doctrine and rule of *auricular confession* (see CONFESSION). In the Protestant churches, public confession of sins by which public scandal has been given, and submission to public rebuke, are sometimes required. Practices more analogous to those of the primitive church were established in many churches after the reformation, but in general have fallen greatly, or entirely, into disuse. The power of exclusion from the Lord's Supper, and from the rights and privileges of church membership, is, however, generally retained and exercised, until, by profession of repentance, and by reformation of life, the cause of such exclusion is removed; and ministers or other office-bearers are, upon offense given in their doctrine or conduct, suspended from their functions, or altogether deposed from their office. The exercise of C. D. belongs more or less exclusively to a hierarchy, or to the office-bearers assembled in church-courts, or to the members of each congregation, according as the church is Episcopalian, Presbyterian, or independent in its church government. There is an increasing tendency among Christians in general to scrutinize closely the claim of right to exercise C. D., and the limits within which it may be exercised.

CHURCH GOVERNMENT. The Christian church, like every other society, must have a certain constitution and rules according to which its affairs are administered. It is disputed, however, among Christians, how far this constitution has been defined, or these rules prescribed by divine authority, and how far they have been left to the discretion of men. The form of C. G. depends primarily on the idea entertained of the constitution of the church. Congregationalists, or independents (q.v.), accordingly place all C. G. in the hands of the members of the congregation and the office-bearers whom they have elected. This theory of C. G. is maintained by many Baptists and others, who, for various reasons, assume different denominations.—Episcopalians and Presbyterians agree that many congregations are to be united under a common government; but this, according to Presbyterians, is properly carried on by ministers and elders of these congregations meeting for this purpose on a footing of equality; whilst, according to Episcopalians, it is more or less absolutely in the hands of bishops, who are superior to the mere pastors of congregations. See EPISCOPACY and PRESBYTERIANISM.

CHURCH HISTORY or **ECCLESIASTICAL HISTORY.** The history of the Christian religion and church forms one of the most important parts of the general history of mankind, and is intimately connected not only with the political history of the world, but with the history of philosophy, of literature, and of civilization. The sources and authorities are extremely various, and their due appreciation often requires as much judgment as their exploration requires toil. Church history is either general—embracing a view of the affairs of the church in the whole world from the beginning to the present day—or particular, relating to some particular country, or time, or portion of the church. By some authors, it has been treated chiefly with regard to the outward affairs of the church; and by others, with reference to doctrine, morals, and the evidences of spiritual life; whilst others still have devoted their attention chiefly to the forms of worship, the constitution of the church, and other things generally comprehended under the name of ecclesiastical antiquities. All these, of course, have important relations to each other. The earliest writers of church history were in general mere chroniclers, following the order of time; in the great work of the Magdeburg centuriators, a method was adopted, of which there had been previous examples, and which afterwards became frequent, of treating each century separately, the centuries being subdivided according to convenience of subjects; but arrangements less mechanical and arbitrary have been adopted by the most eminent modern authors. With much diversity on minor points, there is a general agreement in dividing the whole history of the church into three great periods: the first, from our Saviour to the time of Constantine; the second, from that time to the reformation; and the third, from the reformation to the present day.

The earliest facts of C. H. are to be learned only from the New Testament, after which, however, the epistles and other writings of the apostolic and other primitive fathers afford sources of information, unfortunately very scanty; Hegesippus, who

wrote about the middle of the 2d c., has transmitted to us some very imperfect memorials of these early times; but the first proper ecclesiastical history is that of Eusebius of Cæsarea (324). This work was continued to the 5th c. by Socrates Scholasticus, Hermias Sozomenus, and Theodoret. Similar compilations were executed by Lactantius, Epiphanius, Hieronymus, Theodoret of Cyrus, Philostorgius, and Zosimus. In the 6th c., the chief ecclesiastical historians are—Theodorus Lector, Evagrius, and Nicephorus Callistius; in the 8th, the venerable Bede and Paul Warnefried; in the 9th, Theophanes Confessor, Claudius of Turin, Haymo of Halberstadt, Scotus Erigena, and Hinkmar of Rheims; in the 12th and 13th, Photius, Simeon Metaphrastes, Theophylact, Matthew Paris, Albert of Strasburg, and Ptolemy of Lucca; in the 15th, Laurentius Valla is the most conspicuous name. Protestant writers were the first to treat C. H. in a critical and scientific manner. This was natural, for their position as apparent schismatics compelled them to vindicate historically the changes which they had wrought in the character of the church. Hence their writings were of an apologetic and polemical cast. The first work of this kind was the *Magdeburg Centuries* (q.v.), published by Matthias Flacius. Special histories of the reformation were composed by Sleidan and Seckendorf. In the 17th c., Calixtus distinguished himself in this department, and after him Thom. Illig, Adam Rechenberg, and Thomasius. The new life that awoke in Germany towards the middle of the 18th c., produced a multitude of church historians, of whom we can only afford to mention Arnold, C. M. Pfaff, Mosheim, Semler, and J. Matth. Schröckh; while in still more recent times, Marheineke, Danz, Neander, Gieseler, and Hagenbach have achieved the highest distinction in the same sphere of labor. But others besides the Lutheran divines have rendered valuable services to church history. The reformed church boasts the eminent names of Du Moulin, Joh. Dallæus, Blondel, Hottinger, Spanheim, Turretin, Venema, Jablonski, and recently, D'Aubigné; while among Englishmen, Usher, Pearson, Bingham, Lardner, and recently, Milman and Maurice, have won a distinguished place. Scotland has few names, the chief being Calderwood, Wodrow, M'Crie, and recently Cunningham. In the Roman Catholic church, since the period of the reformation, ecclesiastical historians have rarely manifested a dispassionate and philosophic spirit. They have appeared mainly in the character of defenders of the papacy. The greatest names in C. H. in Catholic France are Tillemont, Bossuet, Bayle, Du Pin, Thomassin, and Fleury. Among the Italians may be mentioned Orsi, Saccharelli, Pallavicini, Guicciardini, and Muratori; and among the Roman Catholics of Germany, Dannenmayr, count Stolberg, Ritter, Hortig, Döllinger, etc.

For the benefit of the English reader, it may be stated that the extensive, profound, and philosophic work of Dr. Augustus Neander has been translated from the original German into English, and is published in 10 vols. by Bohn. See Ecclesiastical Hist.

CHURCHILL, a co. in w. central Nevada, intersected in the n. part by the Central Pacific railroad; 5,800 sq.m.; pop. '80, 479. It is watered by the Humboldt, Carson, Walker, and other rivers. Among the minerals are gold, silver, salt, soda, etc. Co. seat, Stillwater.

CHUR'CHILL, Charles, an English poet, now remembered almost as much for his profligacy as his poetry, was b. at Westminster, where his father was a curate, in 1731. He was educated at Westminster school, and in his 17th year made a clandestine marriage. In 1756, he was ordained, and, two years afterwards, succeeded his father as curate of St. John's, Westminster. Soon after his transference here, he fell into habits very ill-becoming his clerical character. In 1761, he published (at his own risk, the booksellers having refused him five guineas for it) *The Rosciad*, a satire on theatrical managers and performers, which displayed much critical acumen, clever sarcasm, and no little humor, and enjoyed such an immense success that C., who on its publication had withheld his name, was soon delighted to avow himself author. In the same year appeared *The Apology*, a bitter satire on some of his critics, which added alike to his purse and his notoriety. He now totally neglected the duties of his office, was a constant attender at theaters, and altogether led a most dissolute life. His parishioners were scandalized, and his dean remonstrated, whereupon C., to show his utter contempt for the ministerial profession, appeared in a blue coat, gold-laced hat and waistcoat, and large ruffles. He was obliged, however, to resign his preferment, which pecuniary sacrifice was little, as his works brought him considerable sums. He further displayed the complete licentiousness of his nature by separating from his wife, and seducing the daughter of a tradesman in Westminster, and by endeavoring to excuse his vices in a poem called *Night*, on the ground that avowed profligacy was more harmless than profligacy practiced in concealment. The boon-companion of as great a debauchee as himself—Wilkes—he contributed to the pages of the *North Briton*, among other things, *The Prophecy of Famine—A Scots Pastoral*, one of the best of his satires. Among his other works, all more or less satirical, are the *Epistle to Hogarth; The Author; The Candidate; The Ghost; Gotham; The Duellist*, etc., of which *The Author* is the best. He died Nov. 4, 1764, while on a visit to Wilkes at Boulogne. C.'s thorough reprobacy has naturally led to an unjust depreciation of his poetical abilities. See *Poetical Works* by Took (1867), with *Life* by Hannay.

CHURCHILL, John. See Marlborough, *ante*.

CHURCHILL, Missinnippi, or English RIVER, in British North America, rising in Methy lake, and running s.e. through Buffalo and La Crosse lakes, to Hudson's bay; length about 700 miles.

CHURCHILL, Randolph Henry Spencer, Lord. See page 897.

CHURCHING OF WOMEN, a religious usage prevailing in the Christian church from an early period, of women, on their recovery after child-bearing, going to church to give thanks. It appears to have been borrowed from the Jewish law (Lev. xii. 6). In the church of the early ages, it was accompanied with various rites; and in the church of Rome and Greek church, it is imperative. In the church of England, also, a service for the C. of W. finds a place in the liturgy. By the Presbyterian and independent churches of Britain it is rejected, as having no Scripture warrant.

CHURCH OF ENGLAND. See England, Church of, *ante*.

CHURCH OF GOD. See Winebrennerians.

CHURCH OF SCOTLAND. See Scotland, Church of, *ante*.

CHURCH OF SCOTLAND, FREE. See Free Church of Scotland, *ante*.

CHURCH RATES, in England, a tax or assessment laid on the parishioners and occupiers of land within a parish, by a majority of their own body in vestry assembled, for the purpose of upholding and repairing the fabric of the church and the belfry, the bells, seats, and ornaments, the churchyard fence, and the expenses (other than those of maintaining the minister) incident to the celebration of divine service. The parishioners are convened for this purpose by the church-wardens (q.v.). The chancel (q.v.) being regarded as belonging peculiarly to the clergy, the expense of maintaining it is laid on the rector or vicar, though custom frequently lays this burden also on the parishioners, as in London and elsewhere.

The C. R. were anciently a charge on the tithes of the parish, which were divided into three portions: one for the structure of the church, one for the poor, and the third for the ministers of the church. This distribution is said to have originated with pope Gregory, who enjoined St. Augustine thus to divide such voluntary offerings as might be made to his missionary church in England. A canon of archbishop Ælfric in 970, and an act of the Wittenagemote in 1014, in Ethelred's time, have been quoted in proof of the recognition of this rule by our Saxon fathers. It seems to have been their custom, also, to devote to the repair of each church a portion of the fines paid for offenses committed within the district attached to it; and every bishop was bound to contribute to the repair of his own church from his own means. A third of the tithes thus originally devoted to the repairs of churches, continued to be applied to that purpose under the Normans, down to the middle of the 13th c.; and the manner in which this burden came to be shifted to the parishioners, has been a subject of much discussion among legal antiquaries. Lord, then sir John, Campbell, who published a pamphlet on the subject in 1837, is of opinion that the contributions of the parishioners were at first purely voluntary, and that the custom growing, it at last assumed the form of an obligation, and was enforced by ecclesiastical censures. The care of the fabric of the church, and the due administration of its offices, are laid upon the ministers and the church-wardens conjointly, and the latter may be proceeded against by citation, in the ecclesiastical courts, should they neglect these duties. But there is no legal mode of compelling the parishioners as a body to provide the rate; and this circumstance has occasioned much difficulty in imposing the tax in parishes in which dissent is prevalent, and led to many churches falling into a partially ruinous condition. The proper criterion for the amount of C. R. is a valuation of the property within the parish, grounded on the rent that a tenant would be willing to pay for it. Glebe land, the possessions of the crown in the actual occupation of the sovereign, and places of public worship, are not liable for C.R.; but there is no other exception as regards immovable property, and in some parishes, custom even extends it to stock in trade. It has been often decided in the courts that a retrospective church-rate—i.e., a rate for expenses previously incurred—cannot be validly imposed. Much difficulty has been experienced in recovering the rates imposed by the parish on individuals refusing to pay. Previous to 53 Geo. III. c. 127, the only mode was by suit in the ecclesiastical court. That statute, however, in all cases under £10, empowered the justices of the peace of the county where the church was situated, on complaint of the church-wardens, to inquire into the merits of the case, and order payment. Against the decision of the justices, an appeal lies to the quarter-sessions. In 1868. an end was put to all parochial contentions by enacting that no suit or proceeding should thereafter be allowed in any court to enforce or compel payment of a church-rate, except where a local act authorized this rate. But except so far as related to the compulsory payment of these rates, the church-wardens might, as before, make, assess, receive, and deal with such rates. In each district parish, the inhabitants may treat their own church as if it were their parish church, and make and receive rates for the repair of the same. A body of trustees may now be appointed in each parish to receive contributions for ecclesiastical purposes in the parish. The result of this act of 31 and 32 V. c. 109, is thus not to abolish C. R., but rather to convert them into voluntary payments; allowing, as it does, all faithful adherents of the church to contribute, as before, to the repairs of their own churches. In Scotland the burden of upholding the parish churches is by custom imposed on the heritors of the parish; and where the parish is

partly within burgh and partly in the country, the expense must be borne by heritors and proprietors of houses, in proportion to their real rent. See SCOTLAND, CHURCH OF; see also DISSENTERS, and PARISH. [By an act passed in 1868, the compulsory collection of C. R. was abolished, and provision was made for the administration, by a body of church trustees, of such contributions as may be voluntarily agreed to, and of donations and bequests made for ecclesiastical purposes in the parish.]

CHURCH ROAD. See under the article HIGHWAY.

***CHURCH-WARDENS**, in England, are ecclesiastical officers, elected sometimes by the parishioners and minister jointly, sometimes by the minister alone, and sometimes by the parishioners alone, for the purpose of protecting the edifice of the church, superintending the celebration of public worship, and to form and execute other parochial regulations. They are generally two in number. See CHURCH RATES, PARISH, VESTRY. See *Supp.*, page 897.

CHURCH-YARD. See BURIAL, CEMETERY.

CHURN, a machine for agitating milk or cream for the production of butter. The principle of the operation is considered in the article on BUTTER. Of the great variety of forms that have been given to the machine, it is very difficult to determine which deserves the preference. It is obvious that the more thorough and uniform the agitation, the more completely will the butter be separated from the milk. The consistency and color of the butter are also elements in judging of the relative merits of churns. The temperature of the air and the milk affect the butter in these respects. During summer, that of the milk should not exceed 62°, and in very hot weather may be under 60°. During cold weather, the milk should be about 2° higher when put into the churn. The speed at which the operation is performed also influences the result. Trials instituted to test the relative merits of churns have failed to settle which is the best form for actual use in the dairy; for the same machine under different conditions does not always yield the same result. The oldest form is the upright or *plunge* churn. There is a general prejudice in favor of this form of C., on the ground that the butter is more completely separated and of better quality. Its great defect is that the operation, being generally performed by hand, is fatiguing. Recent improvements have chiefly aimed at ease in working, and a saving of time. The original *barrel* C., with a rotatory motion, like a grindstone, which motion was reversed every few rounds, has fallen from its once high repute into comparative neglect. An improvement on the barrel C. was the making of the barrel stationary, the milk being agitated by internal apparatus fixed on a horizontal spindle which is turned by a winch handle. Barrel churns, sometimes of monster size, are generally used in large dairies in Holland. For small or moderate-sized dairies, perhaps the most suitable is the *box* C., consisting of a cubical or oblong box, of birch or plane tree, having the agitators fixed on a horizontal spindle. Churns on a centrifugal action have also been successfully used, particularly in Sweden. More recently, churns of a barrel form, with an oscillating motion like a child's cradle, have been introduced, but without any decisively superior results.

To all forms of churns, power other than manual can be and is applied. In some parts of the continent of Europe, and in America, the dog is employed in churning by means of a contrivance like a squirrel's box. Horse-power is in very general use in large dairies in Great Britain. In very exceptional cases, steam-power is used.

CHUR'RUS. See HEMP.

CHURUBUS'CO, a village 6 m. s. of the city of Mexico, on the river Churubusco, connected with the capital by an elevated paved causeway. In the village is the large convent of San Pablo. In the war between the United States and Mexico, Santa Anna made a stand here, Aug. 20, 1847, but the Americans under gen. Scott were victorious after a sharp action. On the same day occurred the battle of Contreras, and three weeks after that of Chapultepec, and the capture of the Mexican capital.

CHUSAN', an island on the e. coast of China, 40 m. n.e. from Ningpo, in 30° 40′ n. lat., and 121° 48′ e. long., of an oblong shape, and about 50 m. in circumference. It is mountainous; but has many fertile valleys, with a plentiful supply of water, and is very carefully cultivated by the hardy and independent people by whom it is inhabited. Mr. Fortune was struck with the richness of its flora. Azaleas clothe the mountains; clematises, roses, and honeysuckles grow in great luxuriance. The camphor and tallow tree, and many varieties of bamboo, are found in the valleys. Tea is cultivated to some extent on the hill-sides. For three fourths of the year, the climate is temperate. June, July, and Aug. are the hot months. In Aug., the thermometer averages 83°, but in Jan. and Feb. it is often as low as 20°. Ting-hai, the capital, a walled town about 2 m. in circumference, containing a fine specimen of Buddhist temple-architecture, surrendered to the British forces, July 5, 1840, and was retaken by them (having been evacuated the previous Feb.) Oct. 1, 1841. At the close of the war, the island was delivered up to the Chinese. In 1860, it was again occupied by British troops, but restored by the convention of Pekin. Pop. about 200,000.

CHUSAN ISLANDS, a group of islands scattered round the one described above. The most remarkable of these is the sacred island of Pu-tu, lying e. from Chusan. It is covered with Buddhist tempies, pagodas, and monasteries, which latter are inhabited by

a great number of Bonzes, as the Chinese priests are called. The island is devoted exclusively to religious purposes, and no layman is allowed to reside upon it.

CHUTIA, or CHOTÁ, NÁGPUR, a division of British India under the lieutenant-governor of Bengal, comprising the districts of Hazáribágh, Lohárdágá, Mánbhúm, and Sinhbhúm, and the seven tributary states which constitute the south-west frontier agency, between 21° and 25° n., and 82° and 87° e.; 43,901 sq.m.; pop. '72, 3,825,571, residing in 25,766 villages and 725,287 houses. The people consist of 2,567,292 Hindus, 169,006 Mohammedans, 15,798 Christians, and 1,703,475 of no religion specified. The last-named class consists mostly of remnants of tribes driven from the plains by the Hindus. There are in the division only six towns of more than 5,000 inhabitants. The chief productions are rice, corn, pulse, potatoes, and oil-seeds. A little tea is grown in two of the districts. The climate is dry and healthy.

CHUTIA, or CHOTÁ, NÁGPUR TRIBUTARY STATES (of India), seven in number, viz.: Sirguja, Udaipur, Jashpur, Gangpur, Bonái, Koriá, and Chang Bhakár, now under the political superintendence of the commissioner of Chutiá Nagpur, and forming the south-west frontier agency. The states are mountainous, thinly cultivated, and inhabited for the most part by wild aboriginal tribes; area, 15,419 sq.m.; pop. '72, 405,980. There are no towns, and only three villages of more that 1,000 inhabitants.

CHUT'NEE, or CHUT'NY, an East Indian condiment, very largely used in India, and to a considerable and increasing extent in Great Britain. Indian C. is a compound of mangoes, chillies or capsicum (q.v.), and lime-juice, with some portion of other native fruits, such as tamarinds, etc., the flavor being heightened by garlic. It is sometimes manufactured for sale in England, but not in any quantity. Families occasionally make it for their own use, and employ the following ingredients: Chillies, 1 to 1½ lbs.; apples, 1 lb.; red tamarinds, 2 lbs.; sugar-candy, 1 lb.; fresh ginger-root, 1½ lbs.; garlic, ½ to ¾ lb.; sultana raisins, 1½ lbs.; fine salt, 1 lb.; distilled vinegar, 5 bottles. The chillies are to be soaked for an hour in the vinegar, and the whole ground with a stone and muller to a paste.

CHWALYNSK', a t. of Russia on the Volga; pop., 14,262. It is a river port, and has important manufactures.

CHYLE. The food undergoes various changes in the alimentary canal, which will be fully noticed in the article on DIGESTION. One of these changes is its conversion in the stomach into a pulpy mass termed *chyme.* The chyme, which passes onward into the small intestine, is acted upon by the bile, pancreatic fluid, and intestinal juice, and through their influences is separated into the *chyle,* which is absorbed or sucked up by the lacteals (q.v.) and into matters unfit for nutrition, which ultimately find their way out of the system by the intestinal canal. The mode in which this nutritious C. is taken up by vessels distributed over the small intestines, and the changes which it undergoes before it is converted into true blood, are described in the articles LACTEALS, THORACIC DUCT, and NUTRITION. We shall here merely notice its leading physical and chemical properties. When obtained from the thoracic duct of an animal that has been killed while the process of digestion was going on (especially if it had taken fatty food), the C. is a white, milky-looking, or yellowish fluid, with a faintly alkaline reaction. Like the blood, it coagulates in about ten minutes after its abstraction from the body of the animal; and in about three hours a small but distinct gelatinous clot is separated from the serous fluid of the chyle.

On examining C. under the microscope, we find that it contains enormous numbers of minute molecules (probably consisting of fat), together with nucleated cells, which are termed the chyle-corpuscles, and are apparently identical with the white or colorless blood-cells. The chemical constituents of C. are much the same as those of blood; fibrin, albumen, fat, extractive matters, and salts being the most important.

CHYLIF'EROUS SYSTEM. See LACTEALS and THORACIC DUCT.

CHYME. See CHYLE and DIGESTION.

CHYTRÆ'US, DAVID, 1530–1600; an eminent Lutheran theologian. He studied at Tübingen and Wittenberg, and was a pupil of Melancthon. His learning and talents gave him high position, and he was employed by Maximilian II. to arrange ecclesiastical affairs in Austria. He was principal author of the statutes of Helmstadt, and one of the authors of the *Formula of Concord.* He left a number of important theological works.

CIALDINI, ENRICO, was b. at Castel Vetro, Modena, Aug. 10, 1813. Designed for the medical profession, he studied at Parma. When the abortive insurrection of 1831 broke out in the duchies, C. joined the volunteers of Reggio; and on the capitulation of Ancona, embarked for France, where he resumed his medical studies. The struggles against absolutism in the Iberian peninsula opened anew the career of arms to the Italian exiles. He joined the legion raised by Dom Pedro in France against the Miguelists, when his great personal courage soon secured his promotion; and the unanimous vote of his comrades pronounced him the worthiest man to receive the order of the tower and sword decreed by the government to his company. After the capitulation of Evora, C. joined (Oct. 22, 1835) the legion of Oporto, formed under Borso di Carminati for ser-

vice in Spain. In this force, C. gained further honors. In 1843, he followed Narvaez in his march against Madrid; was made by him col. of the regiment of St. Ferdinand; and afterwards employed in organizing the civil guard on the model of the French *gendarmerie*. He was in this force when Charles Albert headed the Italian rising in 1848, when he hurried to Italy, and in the struggle which ensued he received a dangerous wound, and fell into the hands of the Austrians. On his release, he was employed by the Sardinian government to reduce to regular discipline the unruly volunteers from the duchies. He succeeded at last, and fought well at the head of his new regiment in the brief campaign of 1849. During the ten years that elapsed from the defeat of Novara to the renewal of the war in 1859, C. was actively employed. In the Crimea, he commanded the third division of the Sardinian contingent; and on his return was appointed inspector-gen. of bersaglieri and aide-de-camp to the king—a rare distinction for a man of plebeian origin. He was intrusted by Cavour with the formation of the famous Cacciatori delle Alpi, placed under the command of Garibaldi after the declaration of war, and co-operated actively with them at the head of the fourth division. The victory at Palestro was his chief exploit, the further progress of the Italians being stopped by the peace of Villafranca. In 1860, he defeated the papal army under gen. Lamoricière, at Castelfidardo. Diplomacy delayed the fall of Gaeta till Feb. 13, 1861, when it yielded to C. after a vigorous bombardment, as did the citadel of Messina shortly afterwards. Turin erected a statue to C. (*vincitore sempre*), and Reggio elected him deputy in April. For a few months he was governor of Naples. He had to act against Garibaldi in the second Sicilian expedition. When the army of Italy was reorganized in 1863, C. was appointed to one of the chief commands. Senator in March, 1864, he signalized himself by his brilliant speech in favor of the transfer of the capital (Dec., 1864). In the war of 1866, the advice of La Marmora was followed, and the defeat of Custozza was the result. C. was appointed chief of the staff on the resignation of La Marmora. In 1867, C. was intrusted by the king with the formation of a new ministry, but failed; he was also made commander-in-chief of the troops in central Italy. In 1870, he was engaged in the annexation of the papal states; and in 1876, he was sent as ambassador to Paris.

CIBA'O, a range of mountains in the middle of the island of Hayti, about 90 m. long, and having summits more than 7,000 ft. high. Gold has been found in these mountains.

CIBBER, Caius Gabriel, 1630–1700; a sculptor, b. in Holstein, who was engaged to execute the *bassi rilievi* on the pedestal of the London monument, to commemorate the great fire of 1666. He made also the two figures representing "Madness" which once adorned the gate of the old Bethlehem hospital. He built the Danish church in London at his own expense.

ÇIBBER, Colley, was b. on the 6th Nov., 1671, in London. He was sent to the free school at Grantham, in Lincolnshire, in 1682. Five years thereafter, he returned to London, and in 1688 was a volunteer in the forces raised by the earl of Devonshire in support of the prince of Orange. He afterwards conceived a passion for the stage, and after performing gratuitously for several months, he succeeded in obtaining an engagement at 10*s*. per week, which was raised to 15*s*.; and on the commendation of Congreve, who had witnessed his performance of lord Touchwood, five additional shillings per week were added. Incited by this magnificent success, he, at the age of 22, married Miss Shore, to the great rage of her father, who revenged himself by spending the greater portion of his fortune in the erection of a retreat on the banks of the Thames. After marriage, C., discovering that 20*s*. per week was a somewhat insufficient income for an elegant gentleman and an elegant gentleman's wife, was induced to add thereto by the writing of comedies, some of which were remarkably successful. In 1711, he became one of the patentees in the management of Drury Lane, and remained in connection with that theater till 1730; when, on being appointed poet-laureate, he sold his interest in the business. He was, however, sometimes tempted back to the stage by an offer of 50 guineas a night. C. wrote and adapted many plays, but as an author he is best known by his *Apology*. He died suddenly on the 12th Dec., 1757.

CIBBER, Susannah Maria, 1716–66; wife of Theophilus, and daughter-in-law of the dramatist Colley Cibber. Dr. Arne was her instructor in music, in which first she appeared publicly; but after her marriage she preferred tragedy. She is the actress of whom Garrick exclaimed, on hearing of her death, "Then tragedy has expired with her!"

CIB'OL. See Onion.

CIBO'RIUM, a chalice, pyx, or cup, usually of gold or silver, with a cover surmounted by a cross. It is used in the Roman Catholic service to contain the host, or consecrated wafer, in the service of the mass. Ciborium is also the name of a canopy on the altar, supported by four columns, to which the cup, in the shape of a dove, was attached by chains. This especial cup contained the wafer for the communion of the sick.

CIBRA'RIO, Luigi, an Italian historian and politician, was b. at Turin, 23d Feb., 1802. He studied at the university of that city, where he took his degree in 1824 as

doctor of laws. Devoted to historical investigations, he secured a reputation in this important department, at a very early period. In 1825 appeared his *Notizie sulla Storia dei Principi di Savoia;* in 1826, his *Notizie di Paolo Simone de Belli;* and in 1827, his *Delle Storie di Chieri Libri IV.* King Charles Albert—with whom he was always a great favorite—frequently employed him in diplomatic service, and in 1848, when Italy rose against the Austrians, appointed C. extraordinary royal commissioner at Venice. During the same year, he was created a senator of the kingdom. When Charles Albert—after the unfortunate issue of the war—went to live in voluntary exile at Oporto, C. was sent by the Sardinian senate to induce him to return. He wrote an account of his unsuccessful mission, entitled *Ricordi d'una Missione in Portogallo al Re Carlo Alberto* (1850). During his public career, however, C. did not neglect his early and favorite pursuits. In 1839, he published his *Della Economia Politica del Medio Evo;* in 1840, his *Storia della Monarchia di Savoia;* in 1844, his *Storia e Descrizione della Badia d'Altacomba;* and in 1847, his *Storia di Torino.* But the new life and energy which Sardinia began to manifest under Victor Emmanuel had its claims on his public usefulness. In 1850, he was appointed superintendent-general of customs, and while occupying this office introduced several important reforms. Subsequently he was intrusted with full powers to negotiate a treaty of commerce with France, in which he distinguished himself notably by his advocacy of the principles of free trade. In 1852, he was made minister of public instruction, and, in 1855, minister of foreign affairs. When Cavour took this department into his own hands, C. became first secretary of the king. In 1857, he was appointed president of the telegraphic congress of Turin. In 1860, C. again made a most successful appearance as an author, in his *Operette Varie* (Torino), and in his *Jacopo Valperga di Masino, Cancelliere di Savoya.* He died at Salo, in the province of Brescia, 1st Oct., 1870.

CICA'DA, a genus of insects of the order *hemiptera*, sub-order *homoptera*, remarkable for the sounds which they emit, the loudness of which is very extraordinary, when considered with reference to the size of the creatures producing them. The largest European species are only about an inch long. The elytræ, or wing-covers, of the cicadæ are almost always transparent and veined. They dwell on shrubs and trees, of which they suck the juices. The male insects alone possess the organs of sound perfectly developed. These are in no way connected with the mouth or throat, but may be described as a musical apparatus on the under side of the abdomen. This apparatus is very complicated, consisting of a set of membranes and fibers connected with powerful muscles. The sound can be produced even after the insect has been long dead, by pulling the fibers, and letting them escape. Cicadas are most common in tropical and warm temperate regions, and are scarcely known in Britain, although one or two species have been found in the s. of England. The ancients regarded the sounds of these insects as types of music and eloquence. In some countries they bear names which signify that sleep is banished by their din. The sounds produced by some of the South American species, which are much larger than the European, are loud enough to be heard at the distance of a mile, and have been likened to the sound of a razor-grinder at work. The Greek name of the C. is *tettix*, often erroneously translated grasshopper. These insects have indeed no resemblance to grasshoppers, and no power of leaping. C. is the Latin name. The modern Italian is *cicale*, the French *cigale.* Byron speaks of the "shrill cicalas."

CICATRIZA'TION (Lat. *cicatrix*, a scar), the process of healing or skinning over of an ulces or broken surface in the skin or in a mucous membrane, by which a fibrous material, of a dense resisting character, is substituted for the lost texture. The new tissue, in such a case, is called the cicatrix, and usually resembles, to a considerable extent, the structure which it replaces; it is, however, less elastic, and from its shrinking in volume, sometimes produces an appearance of puckering. The glands and other special structures of the original tissue are wanting in the cicatrix, which, however, performs perfectly well, in most instances, the office of protection to the parts below the surface. See INFLAMMATION and ULCERATION.

CIC'ELY, *Myrrhis*, a genus of umbelliferous plants, nearly allied to chervil, of which one species, sweet C. (*M. odorata*), is common in the central and southern parts of Europe, and in similar climates in Asia, but in Britain is so generally found near human habitations that it appears probably to have been introduced. It is sometimes called *sweet chervil*, and in Scotland, *myrrh.* It is a branching perennial, 2 ft. high or upwards. with large triply pinnate leaves and pinnatifid leaflets, somewhat downy beneath; the fruit remarkable for its large size, and, as well as the whole plant, powerfully fragrant, the smell resembling that of anise. The seeds, roots, and young leaves are used in Germany and other countries in soups, etc. The plant was formerly much in use as a medicinal aromatic.

CI'CER. See CHICK PEA.

CIC'ERO, MARCUS TULLIUS, the greatest orator of Rome, and one of the most illustrious of her statesmen and men of letters, was b. at Arpinum, on the 3d of Jan., in the year 106 B.C. He belonged to an ancient family, of the equestrian order, and possessed of considerable influence in his native district. His father, himself a man of

culture, and desirous that his son should acquire an eminent position in the state, removed him at an early age to Rome, where, under the direction of the orator Crassus, he was instructed in the language and literature of Greece, and in all the other branches of a polite education. In his sixteenth year he assumed the manly gown, and was introduced to the public life of a Roman citizen. He now acquired a knowledge of law, and underwent a complete course of discipline in oratory. At the same time, he studied philosophy under three successive preceptors, of the Epicurean, Academic, and Stoic schools, and neglected no mental exercise, however arduous, which might conduce to his future eminence; being thus early of the opinion which he afterwards maintained in his treatise *De Oratore,* that an orator should possess almost universal knowledge. With the exception of a brief campaign under Sulla, in the social war, he passed his time in these preliminary studies until his 26th year, when he began to plead in public. In one of his earliest causes, he distinguished himself by defending the rights of Roscius, a private citizen, against one of the favorites of Sulla, who was then dictator. Soon after, for the benefit of his health, and in order to his improvement in elocution, he traveled to the chief seats of learning in Greece and Asia; and, on his return, was regarded as second to no orator at the Roman bar. Having been elected quæstor (76 B.C.), he was appointed by lot to a government in Sicily, a post which he filled with great ability, and to the entire satisfaction of those whom he governed. Some years after his return, he laid the Sicilians under still greater obligations by his successful prosecution of their prætor, Verres, against whom he prepared no less than six orations, although the first had the effect of disheartening the accused so effectually, that he voluntarily retired into exile. Passing, at short intervals, through the offices of ædile (69 B.C.) and prætor (66 B.C.), he was at length elected, by an overwhelming majority, to the consulship. His tenure of office was rendered memorable by the conspiracy of Catiline, which he frustrated with admirable skill and promptitude. See CATILINE. The highest praises were showered upon C.; he was hailed by Cato and Catulus as the "father of his country;" and public thanksgivings in his name were voted to the gods. But his popularity did not last long after the expiry of his consulship. His enemies charged him with a public crime, in having put the conspiring nobles to death without a formal trial, and he found it necessary to leave Rome, and went to reside in Thessalonica (58 B.C.). A formal edict of banishment was pronounced against him, but he was recalled from exile in about 16 months, and on his return to Rome was received with great enthusiasm. His recovered dignity, however, soon excited the envy of the honorable party in the senate, with whom he had desired to make common cause; while Pompey and Cæsar, the greatest powers in the state, and from whose enmity he had most to dread, courted his alliance and co-operation. Thus, while preserving an appearance of independence, he was betrayed into many actions which he could not but regard as ignominious, and which, by increasing the power of the triumvirs, led indirectly to the ruin of the republic. A remarkable exception to this servile conduct is to be found in his assisting Milo when suing for the consulship, and defending him, against the wish of Pompey, and in spite of the hostile feeling of the populace, after he had slain Clodius in an accidental rencounter. During this period he composed his works, *De Oratore, De Republica,* and *De Legibus.* After a year's admirable administration of the province of Cilicia (51 to 50 B.C.), he returned to Italy on the eve of the civil war. With the convictions which he avowed, there was but one course which it would have been honorable for him to pursue—to enlist himself, at all hazards, on the side of Pompey and the republic. But instead of this he hesitated, balanced the claims of duty and of interest, blamed Pompey for his want of preparation, and criticised the plan of his campaign. At length he joined the army of the senate, but, after the battle of Pharsalia, abruptly quitted his friends, and resolved to throw himself upon the generosity of the conqueror. After nine months' miserable suspense at Brundusium, he was kindly received by Cæsar, whom he followed to Rome. During the years which ensued, he remained in comparative retirement, composing his principal works in philosophy and rhetoric, including those entitled *Orator; Hortensius; De Finibus; Tusculanæ Disputationes; De Natura Deorum; De Senectute; De Amicitia;* and *De Officiis.* On the death of Cæsar, he was disposed to unite his interests with those of Brutus and the other conspirators, but was restrained by dictates of prudence. In the commotions which followed, he espoused the cause of Octavianus, and gave utterance to his celebrated philippics against Antony. These orations were the occasion of his death. When Octavianus and Lepidus joined with Antony in a triumvirate, C. was among the proscribed; and his life was relentlessly sought. The soldiers of Antony overtook him while his attendants were bearing him, now old, and in an infirm state of health, from his Formian villa to Caieta, where he intended to embark. He met his death with greater fortitude than he had supported many of the untoward incidents of his life. Desiring his attendants to forbear resistance, he stretched forward in the litter, and offered his neck to the sword of his executioners. He died in the 63d year of his age, on the 7th Dec., 43 B.C.

The character of C. is one which it is not difficult to estimate. Really a lover of virtue, no one could follow in her footsteps with greater dignity when attended by the popular applause. But he was weak enough to yield to the depraved spirit of his times, and to act according to his convictions only when they were not evidently discordant with his private interests. Few men, possessing such talents, have been so

utterly devoid of anything approaching to heroism. As a statesman, it would be unjust to deny his legislative abilities; but he was generally deficient in courage and resolution. He was one of the greatest masters of rhetoric that have ever lived. His orations were the result of consummate art, combined with unwearied industry, and survive as characteristic memorials of a time when eloquence, far more than at present, was a power which bent the verdicts of judicial tribunals, and influenced the decrees of the state. In philosophy, he does not rank with the original thinkers of antiquity; nor, in truth, did he aspire to do so. His writings on speculative subjects are chiefly valuable on account of the noble and generous sentiments which they contain, and as reflecting the varied thought of the different schools. The best edition of his collected works is Orelli's (9 vols. 8vo, 1826–1837). See Forsyth's Life of C. (1864).

CICERO'NÉ (from Cicero, the orator or speaker), a guide, usually for the purpose of showing the curiosities and works of art in a town to strangers. Ciceronés are of all degrees, from distinguished archæologists, who undertake the office as a favor, to the humble *laquais de place*, who, though quite indispensable on a first arrival, is too often both incompetent and dishonest. The stranger ought to be particularly on his guard against allowing a C. to make purchases for or even with him, as the practice of adding a commission to him to the price charged now prevails probably in every country in Europe.

CICHO'RIUM. See Chicory and Endive.

CICINDELA, a genus of insects of the order *coleoptera*, section *pentamera*, the type of a large family, *cicindelidæ*. This family is nearly allied to *carabidæ*, and the insects belonging to it are among the most voracious of those beetles which, both in their perfect and lava state, prey on other insects. They have a strong head, with projecting toothed mandibles, and are particularly distinguished by a sort of hook or nail, which is articulated by its base to each of the lower jaws or maxillæ. They are more abundant in tropical than in cold countries; a few species, none of them large, are found in Britain. The head of the larva is large, concave above, and the back furnished with two remarkable hooked spines, which are said to be used as anchors to fix it at any part it chooses of its burrow in the earth; whilst the soil which it excavates is carried to the mouth of the burrow in a sort of natural basket formed of the concave back of the head and the recurved mandibles. The larva lies in wait in its burrow, its head just level with the ground, till its prey comes within reach, upon which it suddenly rushes. —*C. campestris*, a green species with whitish spots, is common in most parts of Britain in dry sandy places exposed to the sun.

CICISBE'O is the name given in Italy to the professed gallant or constant attendant upon a married lady. In the higher ranks of Italian society, it was at one time considered unfashionable for the husband to associate with his wife anywhere except in his own house. In society, or at public places of amusement, the wife was accompanied by her C., who attended at her toilet to receive her commands for the day. This custom, which was once universal, and which naturally gave rise to much scandal, has now almost disappeared. C. is synonymous with *cavaliere servente*.

CICOGNA'RA, Leopoldo, Count da, 1767–1834; an archæologist and art-critic of Ferrara. He visited all the noted cities of southern Europe, studying them with the eye of an archæologist and connoisseur. Napoleon found him engaged in politics and a member of the legislative body of Modena. In 1808, C. was made president of the academy of fine arts in Venice. In 1813–18, he produced his great work on the history of art, designed to complete the labors of Winckelmann and d'Agincourt. He published many other elaborately illustrated works.

CICO'NIA. See Stork.

CICU'TA. See Hemlock.

CID'ARIS, a genus of *echinidæ* (q.v.), or sea-urchins, closely allied to the genus *echinus* itself, and included along with it in a family or tribe called *cidarites*, in which the mouth and anus are opposite to each other—the mouth below, and the anus above. Only one species, *C. papillata*, has been found in the British seas, and that only on the coasts of Zetland. The Zetlanders call it the *piper*, from a resemblance which they trace in its globe and spines to a bagpipe. They say that it is sometimes found with spines a foot long. The markings of the shell and spines are extremely beautiful.

CID CAMPËADOR is the name given in histories, traditions, and songs to the most celebrated of Spain's national heroes. There is so much of the mythical in the history of this personage, that hypercritical writers, such as Masdea, have doubted his existence; but recent researches, more particularly those of Dozy, and the investigation of newly discovered Arabic sources, have succeeded in separating the historical from the romantic. See Dozy's *Récherches sur l'Histoire Politique et Littéraire de l'Espagne pendant le moyen âge* (Leyden, 1849). The following is the result of these inquiries: Roderigo Ruy Diaz (Roderic the son of Diego) was descended from one of the proudest families of Castile. His name first appears in a document written in 1064, during the reign of Ferdinand of Leon. Under Sancho II., son of Ferdinand, he became standard-bearer and commander of the royal troops. In a war between the two brothers, Sancho

II. and Alfonso VI. of Leon, it was a stratagem of Roderic's—which, according to modern notions, was anything but honorable—that secured the victory of Sancho at Llantada (1068) over his brother, who was forced to seek refuge with the Moorish king of Toledo. He appears at this time to have already been called the *campeador*, a word supposed to answer to our champion.

Upon the assassination of his friend and patron, king Sancho, he required the next heir, don Alonzo, to clear himself by oath of any participation in his brother's murder, ere the nobles of Leon and Castile should do homage to him. By this act, he incurred the new monarch's enmity; an enmity which, however, the king's policy concealed in the hour of danger, and he even consented to Roderic's marriage with his cousin Ximena—daughter of Diego, duke of Asturia. But when the king thought the services of Roderic no longer necessary to his own safety, he lent a willing ear to the latter's personal enemies, and banished him in 1081. Roderic then joined the Moorish kings of Saragossa, in whose service he fought against both Moslems and Christians. It was probably during this exile that he was first called the Cid or Sîd, an Arabic title which means lord. He frequently defeated the king of Aragon and the count of Barcelona, the latter of whom, Berenguer Ramon II., he took prisoner.

He was again reconciled to the king, but only for a short time, when he was condemned to a second exile. In order to support his family and numerous followers, he now saw himself forced to carry his sword against the Moors, over whom he gained a victory, and established himself as sovereign or lord of Valencia (1094). He retained possession of Valencia five years, during which time he took many neighboring fortresses. He died of grief in 1099, on learning that his relative and comrade in arms, Alvar Fañez, had been vanquished by the Moors, and that the army which he had sent to his assistance had been defeated near Alcira. After the Cid's death, his widow held Valencia till 1102, when she was obliged to capitulate to the Almoravides, and fly to Castile, where she died in 1104. Her remains were placed by those of her lord in the monastery of San Pedro de Cadeña. The Cid had a son, who was slain by the Moors in a battle near Consuegra. He also left behind him two daughters, one of whom was married to the count of Barcelona; the other to an infant of Navarre, through whom the kings of Spain and many royal houses of Europe claim kindred with "*Mio Cid el Campeador.*" Relics of the "Blessed Cid," as he is still called in Spain, such as his sword, shield, banner, and drinking-cup, are still held in great reverence by the populace. The numerous *Cid romances* that were first published in the 16th c., contain the most romantic improbabilities concerning the life and deeds of the Cid. See *Silva de Varios Romances* (1550), and *Romancero General* (1604). These romances were taken from the ancient *cantares* (national songs) and *poemas*, most of which are entirely lost. The most important of modern works on this subject, besides that of Dozy above mentioned, are Huber's *Geschichte des Cid*, etc. (Bremen, 1829), and Southey's fascinating *Chronicle of the Cid* (Lond. 1808). The former of these is, however, the more valuable in a historical point of view. See also Willemaers, *Le Cid* (Bruss. 1873).

CIDER is the fermented juice of apples, and is extensively prepared in Gloucestershire and other parts of England, in Ireland, in the northern districts of France, and in North America. In Normandy, a vast number of varieties of acid or bitter-apples are grown for the preparation of cider. The apples are first bruised in a circular stone-trough or *chase*, by a similarly shaped stone or *runner*, which revolves by machinery in the interior of the trough. The pulp so obtained is placed in sieve-bags made of hair-cloth or reed-straw, and subjected to pressure, which yields a dark-colored, sweet liquid, and leaves in the bag a somewhat dry residue, consisting of the pips, skin, and other fibrous parts of the apple. The apple-juice passes first into a shallow tub or *trin*, and is almost immediately placed in casks in a cool place, when fermentation begins, part of the sugar is converted into alcohol, and in a few days, a clear liquid is obtained, which can easily be racked off from sedimentary matter. C. is largely used in England as a beverage, and is very palatable and refreshing. It contains from 5¼ to 9 per cent of alcohol, and is therefore intoxicating when drunk in quantity. It does not possess the tonic and nourishing properties, however, of bitter-beer. C. quickly turns sour, becoming *hard* C., owing to the development of lactic acid, and great difficulty is experienced in the attempt to preserve it.

CIENFUE'GOS, a city in Cuba, on the s. coast of the island, on the bay of Jagua, 120 m. s.e. of Havana; pop. 9,950. It has a good harbor, and is one of the best built cities in the island. Railroads give communication with Cardenas and other towns on the n. coast. C. was founded in 1813 by a captain-general of that name.

CIE'ZA, a t. of Spain, in the province of Murcia, 26 m. n.w. of the city of that name. It is situated on an eminence near the river Segura, overlooking a plain of great fertility. The streets are tolerably wide and well paved, and there are manufactures of linen, hempen fabrics, wine, and oil; and silk-worms are reared. Pop. 9,500.

CIGARETTE. See page 897.

CIGARS. See TOBACCO.

CI'GOLI, LUDOVICO CARDI DA, an eminent painter of the later Florentine school, which, about the end of the 16th c., developed, in opposition to the languid mannerists of the time, a peculiar *eclectic* style of art. C. was b. at Empoli in 1559. His model was

Correggio; but as the latter was deficient in design, and in the scientific knowledge of perspective, C. endeavored to unite these with the warm bright coloring and wonderful chiar-oscuro of Correggio. He was invited by Clement VII. to Rome, where he died in 1613. Among C.'s most famous pictures may be mentioned—"The Healing of the Lame Man" (St. Peter's, Rome), "The Martyrdom of St. Stephen" (Uffizi Gallery, Florence), "Tobias in the Act of Thanking the Angel" (St. Petersburg), and "St. Francis," a favorite subject with C. (Pitti Palace, Florence). C. was also held in high estimation as an architect, and designed several of the Florentine palaces.

CIL'IA, (Lat. eyelashes), a term variously employed in botany and zoology to designate fringing hairs or hair-like processes. Thus, the margins or nerves of leaves, petals, etc., are often described as *ciliated* or furnished with cilia. The fine thread-like processes which surround the opening of the fruit of many mosses, are called C.; but these processes, when broader, are denominated teeth.—The description and uses of C. in the animal kingdom are given in the article EPITHELIUM.

CILIC'IA, an ancient division of Asia Minor, now included in the Turkish eyalet of Koniah. The Taurus range, which separated it from Cappadocia, bounded it on the n., the gulf of Issus and the Cilician sea on the s., while the Amanus and Pamphylia bounded it respectively on the e. and west. Lat. 36° to 38° n., long. 32° 10′ to 37° 8′ e. The eastern portion of C. was fertile in grain, wine, etc.; while the western and more mountainous portion furnished inexhaustible supplies of timber to the ancients. The pass called by the Turks Gölek Bógház is that by which the younger Cyrus passed from Tyana in Cappadocia to Tarsus; and it is also the same by which Alexander the great entered Cilicia. Pop. about 100,000, mostly nomadic.

In early ages, C. was ruled by its own kings, the dynasty of Syennesis being apparently the most important. The Cilicians were a distinct people in the time of Xenophon; but the Greeks appear to have got a footing after the time of Alexander. The Cilicians were notorious pirates, but having carried on their depredations too close to the shores of Italy, the Roman arms were turned against them, and C. was made a Roman province in Pompey's time.

CIMABU'É, GIOVANNI, one of the restorers of the art of painting in Italy, which had fallen into neglect during the barbarism of the dark ages, was b. at Florence in 1240. At this time, the fine arts were practiced in Italy chiefly by Byzantines, and had degenerated into a worn-out mechanical conventionalism. C. at first studied under Byzantine masters, and adopted their traditional forms, but gradually excelled his teachers, made innovations on the fixed patterns set before him, and gave life and individuality to his works. Two remarkable pictures of the Madonna by C. are still preserved in Florence—one (chiefly Byzantine in style) in the academy; the other, displaying a more purely original genius, in the church of Santa Maria Novella. It is said that this latter work in the time of C. was admired as a miracle of art, and was carried to the church in a sort of triumphal procession. More remarkable pictures in point of expression or dramatic effect, are found in C.'s frescoes in the church of San Francisco at Assisi. C. died soon after 1300. What strikes one as very wonderful about C.'s pictures, is the accuracy of his naked figures, considering that he had no better professional guides than the Byzantine artists. His draperies were also very good, but he had apparently no knowledge of perspective, though acquainted with architecture. His greatest pupil was Giotto (q.v.).

CIMARO'SA, DOMENICO, an Italian composer of operas, was b. at Naples in 1755, and was educated in music under Sacchini, and in the conservatory of Loretto. His first pieces were the *Sacrificio di Abramo* and the *Olympiade*. When barely 22, he had achieved a reputation in all the leading Italian theaters. He was then called to St. Petersburg, where he resided four years. Afterwards, he lived at various German courts; thence he proceeded to Vienna, where he became imperial chapel-master; and finally, he returned to Italy. At Naples, his comic opera, *Il Matrimonio Segreto*, composed at Vienna, 1791, was repeated 57 times in succession. C. died at Venice in 1801. His comic operas are remarkable for their novelty, spirit, whimsicality, and liveliness of idea, as well as for their great knowledge of stage-effect. The wealth and freshness of his invention gave rise to the saying, that one finale of C. contained material for a dozen operas.

CIM'BALO, a musical instrument with a set of keys like the clavecin or harpsichord.

CIM'BRI, or KIM'BRI, a people who issued from the n. of Germany in conjunction with the Teutones, and first came into hostile contact with the Romans in the eastern Alps in 113 B.C. They were victorious in several great engagements, and were only prevented from devastating Italy by sustaining a terrible defeat from Marius, on the Raudii Campi, near Verona, or, according to others, near Vercelli, in Aug., 101 B.C. Their infantry fought with their shields fastened together by long chains; their horsemen, of whom they had 15,000, were well armed with helmet, coat of mail, shield, and spear. Marius had so chosen his position that the sun and dust were in their faces, and yet they contested the victory most bravely with the Romans, who were 55,000 strong. When the battle was lost, the women, who remained in the camp formed of the wagons, killed themselves and their children. 140,000 C. are said to have fallen in the battle;

the number of prisoners is given at 60,000. It is not till long afterwards, when the Romans themselves penetrated into Germany, that the name of the C. again appears. Cæsar represents the Aduatici of Belgium as the descendants of the C. and the Teutones. Tacitus speaks of a people, bearing the name of C., few in number, but of great reputation, that sent ambassadors to Augustus. This people lived in the extreme n. of Germany, on the borders of the ocean; according to Pliny and Ptolemy, at the extremity of the peninsula called from them the Cimbric Chersonese, now Jütland. The ethnology of the C. is doubtful. Greek writers associated them groundlessly with the Cimmerians (q.v.); Sallust calls them Gauls; Cæsar, Tacitus, and Plutarch looked upon them as Germans, and the opinion of their German origin has been adopted by most moderns. Yet H. Müller, in his *Marken des Vaterlands* (1837), has endeavored to show that they belonged to the Celtic race, and lived originally on the n.e. of the Belgæ, of kindred origin; and that their name is the same as that by which the Celts of Wales designate themselves to this day—*Cymri.*

CI'MEX AND CIMI'CIDÆ. See BUG.

CIMICIF'UGA, or BUGBANE, an herb of the order *ranunculaceæ.* It is the black snake-root found in all the northern states, and much used in rural districts as a medicine, chiefly in the form of a decoction. It is believed to be useful in nervous diseases, rheumatism, and bronchitis.

CIMIN'NA, a t. of Sicily, in the province of Palermo, 18 m. s.e. of the city of that name. Pop. '71, 5,721.

CIMME'RIANS, or CIMME'RII, in the poems of Homer, the name of the people dwelling "beyond the ocean-stream," where the sun never shines, and perpetual darkness reigns.—But the historic C. were a people whose country lay between the Borysthenes (Dnieper) and the Tanais (Don), including also the Tauric Chersonesus (Crimea). The Cimmerian Bosporus (strait of Yenikale) derived its name from them. Being driven out by the Scythians, they migrated to Asia Minor, dwelt there for some time, plundered Sardis, failed in an attempt upon Miletum, and were finally routed and expelled by the Lydian king Alyattes, some time after 617 B.C.

CIM'OLITE. See FULLERS' EARTH.

CI'MON, an Athenian commander, was the son of Miltiades, the conqueror at Marathon. In conjunction with Aristides, he was placed over the Athenian contingent to the allied fleet, which, under the supreme command of the Spartan Pausanias, continued the war against the Persians (477 B.C.). He effected the important conquest of Eïon, a town on the river Strymon, then garrisoned by the Persians. Later (according to Clinton, 466 B.C.), when commander-in-chief, he encountered a Persian fleet of 350 ships at the river Eurymedon, destroyed or captured 200, and defeated the land-forces on the same day. He succeeded likewise in driving the Persians from Thrace, Caria, and Lycia; and expended much of the money which he had obtained by the recovery of his patrimony in Thrace upon the improvement of the city of Athens. At this period he appears to have been the most influential of the Athenians. The hereditary enemy of Persia, it was his policy to advocate a close alliance with Sparta; and when the Helots revolted, he led an army upon two occasions to the support of the Spartan troops; but on the latter occasion, having lost the confidence of his allies, he was ignominiously dismissed. After his return to Athens, his policy was opposed by the democracy, headed by Pericles, who procured his banishment by ostracism. He was recalled in the fifth year of his exile, and was instrumental in obtaining a five years' armistice between the Spartans and the Athenians. He died in the year 449 B.C., while besieging the Persian garrison of Citium, in Cyprus.

CINALO'A, a t. of Mexico, in the state of the same name, on the Rio Cinaloa, about 50 m. from its entrance into the gulf of California. It is a thriving place, with gold-washings in the vicinity. Pop. about 9,000.

CINALOA. See SINALOA.

CINCHO'NA, a most important genus of trees of the natural order *cinchonaceæ;* yielding the bark so much valued in medicine, known as Peruvian bark, Jesuits' bark, China bark, quina, quinquina, cinchona bark, etc., and from which the important alkaloids *quinia* or *quinine* (q.v.), and *cinchonia* or *cinchonine,* are obtained. The species of this genus are sometimes trees of great magnitude; but an after growth springing from their roots when they have been felled, they often appear only as large shrubs; and some of them in the highest mountain-regions in which they are found, are low trees with stems only eight or ten feet in height. They exist only in South America, between s. lat. 20° and n. lat. 10°, and chiefly on the eastern slope of the second range of the Cordilleras. All the cinchonas are evergreen-trees; with laurel-like, entire, opposite leaves; stipules which soon fall off; and panicles of flowers, which, in general appearance, are not unlike those of lilac or privet. The flowers are white, rose-colored, or purplish, and very fragrant. The calyx is small and 5-toothed; the corolla tubular with a salver-shaped 5-cleft limb. In the true *cinchonas,* the capsule splits from the base upwards; the species in which it splits from above downwards form the sub-genus *cascarilla;* the

distinction acquiring importance from the consideration, that the barks of the former alone contain the alkaloids so valuable in medicine; and this property is further limited to those species which have the corolla downy or silky on the outside. Beyond the botanical limits thus narrowly marked out, not a trace of these alkaloids has yet been discovered anywhere.

Great difficulty has been found in determining the species by which the different varieties of C. bark known in commerce are produced. The common commercial names are derived partly from the color of the kinds, and partly from the districts in which they are produced, or the ports where they are shipped. It appears, however, to be now ascertained that *calisaya bark*, also called royal or genuine yellow bark, one of the very best kinds—mostly shipped from Arica—is chiefly the produce of *C. calisaya*, a large tree, growing in hot mountain valleys of Bolivia and the south of Peru. To give all the varieties of bark and species of tree would go beyond our limits.

The accurate discrimination of the different kinds of bark requires much experience. The taste is always bitter; but it is possible even to distinguish by the taste those varieties which contain quinia most largely from those in which cinchonia is most abundant.

The cutting and peeling of C. trees are carried on by Indians, who go in parties, and pursue their occupation during the whole of the dry season. They build a hut, which serves both for their abode and for drying the bark. The trees are felled as near the root as possible, that none of the bark may be lost; and the bark being stripped off, is carefully dried; the quilled form of the thinner bark is acquired in drying. The bark is made up into packages of various size, but averaging about 150 lbs. weight, closely wrapped in woolen cloth, and afterwards in hides, to be conveyed on mules' backs to the towns. These packages are called drums or *seroons*. It is in them that the bark is always brought to Europe.

A number of spurious kinds of Peruvian or C. bark are either sent into the market separately, or are employed for adulterating the genuine kinds. They are bitter barks, and have, in greater or less degree, febrifugal properties, but are chemically and medicinally very different from true C. bark. They are produced by trees of genera very closely allied to cinchona.

Whilst C. trees have been becoming every year more scarce in their native regions, no attempt has been made to cultivate them there, notwithstanding the constantly increasing demand for the bark; but the Dutch have recently made extensive plantations of them in Java; and the same has been done in British India, from seeds and plants obtained from the South American governments, by Mr. Markham. In the course of his researches in South America, Mr. Markham found only one C. tree planted by human hands. See PERUVIAN BARK.

The Indians of Peru call the C. trees *kina*, from whence are derived the names *china*, *quina*, etc. But it is not certain that they knew the use of the bark before the arrival of the Spaniards. It is a medicine of great value in the cure of intermittent fevers (see AGUE), and diseases attended with much febrile debility; also in certain forms of neuralgia (q.v.), and other diseases of the nervous system. It seems to have been first imported into Europe in 1639, by the countess Del Cinchon or Chinchon, the wife of the viceroy of Peru, who had been cured of an obstinate intermittent fever by means of it, and upon this account it was named *C. bark* and *countess's powder* (*pulvis comitissæ*). The Jesuit missionaries afterwards carried it to Rome, and distributed it through their several stations, and thus is acquired the name of *Jesuit's bark* and *powder of the fathers* (*pulvis patrum*). Cardinal Juan de Lugo having been particularly active in recommending and distributing it, it was also known as *Cardinal de Lugo's powder*. It attained great celebrity in Spain and Italy, being sold at high prices by the Jesuits, by whom it was lauded as an infallible remedy, while by most of the orthodox physicians it was coldly received, and by the Protestants altogether repudiated. Its mode of action not being well understood, and the cases to which it was applicable not well defined, it seems, in the first instance, to have been employed without due discrimination, and to have fallen very much into the hands of empirics. Falling, however, into disuse in Europe, it was again brought into notice by sir Robert Talbor or Talbot, an Englishman, who brought it to England in 1671, and acquired great celebrity through the cure of intermittents by means of it, and from whom Louis XIV. purchased his secret in 1682. A pound of bark at that time cost 100 louis-d'or. Talbor seems to have been a vain and self-seeking man, but who had, nevertheless, the acuteness to discern and systematically to avail himself of the healing virtues of the neglected Jesuits' bark, which he mixed with other substances, so as to conceal its taste and odor. Soon afterwards, both Morton and Sydenham, the most celebrated English physicians of the age, adopted the new remedy; and its use, from this period, gradually extended, both in England and France, notwithstanding the opposition of the faculty of medicine in the latter country. As it came into general use, it became a most important article of export from Peru; but for a long time, the value of the bark to be procured in New Granada remained unknown; and in order to the maintenance of a commercial monopoly, extraordinary methods were even employed to prevent it from becoming known at a comparatively recent period of Spanish rule in America. The discovery of the alkaloids on which its properties chiefly depend, constitutes a new era in the history of this medicine, and did not take place till the beginning of the present century.

The chief active principles are the two alkaloids, quinine (q.v.) and cinchonine. The latter is not generally present in so large a proportion as the quinine, and does not possess such powerful medicinal properties. When isolated, the alkaloid *cinchonia*, or cinchonine, has the formula ($C_{40}H_{24}N_2O_2$), and can be obtained in a crystallized state.

C. bark itself has, in later times, fallen into comparative disuse, owing to the discovery of the alkaloid quinine, which is now extensively in use in medicine in the form of sulphate or disulphate of quinine, and is given in doses of from one to twenty grains, in almost all the cases to which the bark was supposed to be applicable.

CINCHONA'CEÆ, a natural order of exogenous plants, consisting of trees, shrubs, and herbaceous plants, with simple, entire, opposite, or whorled leaves, and stipules between their foot-stalks. The calyx is adherent to the ovary; the corolla is tubular and regular, its segments are equal in number to those of the calyx, when the calyx is divided; the stamens arise from the corolla, and are alternate with its segments. The ovary is surrounded by a disk, and usually two-celled; the style single, the fruit either splitting into two halves or not splitting at all, either dry or succulent.—This order has been very generally regarded by botanists as a sub-order of *rubiaceæ* (q.v.), but far exceeds all the rest of that order, both in the number and importance of its species, of which from 2,500 to 3,000 are known, mostly tropical, and the remainder, with few exceptions, subtropical. The C. are nearly allied to *caprifoliaceæ* (woodbines or honeysuckles, etc.), and interesting relations have been pointed out between them and *umbelliferæ*. They constitute a very large part of the flora of tropical regions. Besides the genus *cinchona* (q.v.) and other genera producing febrifugal barks—*exostemma*, *condaminea*, *Pinckneya*, *Portlandia*, etc.—the order produces a number of valuable medicinal plants, of which ipecacuanha (q.v.) is the most important. The coffee (q.v.) shrub belongs to it; and also the tree which yields gambir (q.v.). It produces a number of plants employed in dyeing, among which are the chay root or choya, and some species of *morinda*. Some trees of this order yield valuable timber. Many of the species have beautiful and fragrant flowers; and some produce pleasant fruits, among which are the genipap (*genipa Americana*) of South America, the native peach (*sarcocephalus esculentus*) of Sierra Leone. and the voavanga of Madagascar (*vangueria edulis*).

CINCINNATI, the commercial capital of Ohio, is situated on the right bank of the river which gives name to the state, and separates it from Virginia and Kentucky. It stands in lat. 39° 6′ 30″ n., and in long. 84° 26′ w., 458 m. below Pittsburg, in Pennsylvania, where the Ohio, as such, is first formed, and 500 m. above the junction of that stream and the Mississippi. Though C. was founded in 1788, yet in 1800 it had only 750 inhabitants. In the years 1820, 1830, 1840, 1850, and 1860, respectively, the census returns showed a population of 9,602, 24,830, 46,338, 115,438, and 161,004. In 1870, it had increased to 216,289, including a large proportion of Germans and Irish. The natural facilities of C. for commerce are great, and they have been increased artificially by the Miami canal, which unites it with lake Erie. Railways branch off from C. as a center in several directions, and the river Ohio gives facility for the carrying on of a large portion of the commerce. In the ten years ending 1875, the exports averaged $201,236,066, and the imports $314,528,009; being together equivalent to about £110,000,000. The clearing house exchanges, '83, amounted to $494,414,900.

The staple article of the trade of C. is pork. In 1882–83, 425,400 hogs were slaughtered. Wine from the Catawba (q. v.) grape is made in the neighborhood to a great extent. The city itself also is largely engaged in a variety of important manufactures, hundreds of steam-engines being employed in the different establishments, and the aggregate product having, in 1874, been computed at $144,207,371. The manufactories include iron-foundries, rolling-mills, lard, oil, and stearine factories; and countless works connected with flour, clothing, furniture, paper, printing, tobacco, soap, candles, hats, etc. In '83, tobacco was produced to the value of $41,500,000; iron, $10,900,000; carriages, $9,935,112; and liquors, $35,500,000. There are about 133 newspapers and periodicals, including 14 daily, of which 5 are in German.

C. is substantially and handsomely built. Its ecclesiastical, literary, and commercial edifices are as numerous as befits the acknowledged queen of the west. The city occupies chiefly two terraces, which are elevated respectively 50 ft. and 108 above the level of the river. For the supply of the inhabitants, the water of the Ohio has been lifted up into an immense reservoir, at an expense of about £160,000. A large suspension bridge, 100 ft. above low-water, connects the city with Covington in Kentucky. There is a railway pier-bridge. Education flourishes, and there are numerous free schools. One part of the city, called "over the Rhine," contains over 90,000 Germans.

*CINCINNATI (*ante*), the chief city of Ohio, covers an area of 24 sq.m., and is laid out upon a plan substantially like that of Philadelphia, the long streets and avenuues, mostly 66 ft. or more in breadth, being generally well paved or macadamized, and some of them adorned with shade-trees. The buildings are mostly of brick, and very substantial. Some of the streets leading back from the river towards the high hills on the w. are of a steep grade. The summits of these hills, which have been made accessible, command highly picturesque views of the surrounding country, including a wide sweep of the territory on the other side of the river, in Kentucky. The main portion of the city lies between Deer creek on the e. and Mill creek on the w., these two streams enter-

ing the Ohio at a distance from each other of 2½ miles. The hillsides between the crecks, n. of East Liberty street and Hamilton road, are terraced with streets to the summits, and covered with dwellings. On some of the western hills are vineyards and gardens. The suburban portions of the city in various directions are very attractive, being filled with elegant and costly private residences, surrounded by trees and shrubbery and cultivated lawns, with picturesquely winding paths. There are beautiful drives in various directions, the roads being fine and the scenery of a very attractive character. The city is well provided with parks and public grounds. Eden park, on a hill in the eastern district, commands a fine prospect. It contains 216 acres. Lincoln, Washington, Hopkins, and City parks near the center of the city, are beautiful, though small. Burnet woods contains 170 acres, nearly all forest. Spring Grove, a beautiful cemetery, is 3 m. n.w. of the city, in the valley of Mill creek. It is approached by an avenue 100 ft. wide, and contains 600 acres of land tastefully laid out, and has a large number of costly monuments, among which are the Dexter mausoleum, and a bronze statue commemorating the suppression of the rebellion of 1861. The most noteworthy work of art in the city is the Tyler Davidson fountain, in Fifth street between Vine and Walnut, which was cast at the royal foundry in Munich, and which cost $200,000. It was suggested by Mr. Tyler Davidson, after whose death it was completed and presented to the city by Mr. Henry Probasco in 1871. Standing in a conspicuous place, it is an object of perpetual interest to citizens and strangers. During the warm days of summer, from early morning till midnight, its flowing jets make their welcome music, and impart a refreshing coolness to the air. The suspension bridge across the Ohio, connecting Cincinnati with the Kentucky shore at Covington, was designed by John A. Roebling, and completed in 1867 at a cost of $1,800,000. Another bridge, of wrought iron and resting upon piers, connects the city with Newport, Ky., and is used for both railroad and ordinary travel. Many of the public buildings of Cincinnati are distinguished for architectural beauty. The U. S. government building, containing the post-office, custom-house, court-rooms, and various offices, presents a front of 150 ft. on Vine street, and 80 ft. on Fourth street. It is of sawed freestone, three stories high, in the Roman Corinthian style. The county court-house is a square of three stories, and nearly fire-proof. Its cost was $500,000. With the county jail in its rear it occupies a whole square. The buildings for the use of the city government are less imposing, though well adapted to their purpose. The city hospital, consisting of eight distinct buildings arranged around a central court, occupies a square of nearly four acres. It cost over $700,000, exclusive of the ground, which is worth $300,000 more. It has accommodations for 700 patients. The public library, built of brick in the Romanesque style, with funds raised by taxation, cost about $675,000. Masonic hall, in the Byzantine style, 195 by 100 ft., and four stories high, is a very imposing edifice. Pike's opera-house also is of grand dimensions, with a front of 134 ft. and a depth of 170 feet. Mozart hall is a massive edifice, with an auditorium seating 3,000 people. St. Xavier's college is a splendid building, in the Romanesque style. The city work-house, 515 ft. long, has cells for 700 prisoners, with workshops and grounds for their employment. Longview asylum for the insane, at Carthage, 10 m. from the city, is of brick in the Italian style, 612 ft. long and four stories in height. The value of the buildings and grounds is $1,000,000. St. Peter's cathedral (Roman Catholic) is the finest church edifice in the city. It is 180 ft. long and 60 and 90 ft. deep, in the pure Grecian style, with a stone spire 224 ft. high. The number of churches in Cincinnati exceeds 200, of which upwards of 50 are Roman Catholic, the rest being divided among a large number of Protestant sects. The public library contains 138,000 volumes, the young men's mercantile library 44,000, and the historical library 18,000 and many valuable MSS. There are in the city five literary colleges, six medical colleges, one law school, one college of dentistry, five commercial colleges, and a university. The common schools, about 40 in number, are well organized and managed. The Woodward and Hughes high schools have a high reputation for efficiency. The Roman Catholics support over 100 parochial schools. The Wesleyan college for women, established here in 1842, has preparatory, academic, and collegiate departments, and a department of music and art. St. Xavier's college, administered by the Jesuits, affords instruction to many students. Lane theological seminary, on Walnut hills, a Presbyterian institution, was organized in 1829, with an endowment of $200,000. Cincinnati is the center of a vast network of railroads, by means of which it is in direct and easy communication with every portion of the country. It is connected with lake Erie by the Miami canal, and the Ohio river opens for it a channel of intercourse with a vast region, rapidly increasing in population and commerce. It is well supplied with daily and weekly papers and other periodicals, and is the center of a vast and various manufacturing industry and a widely extended commerce. Pop. in '80, 255,804. The city was founded in 1789 by settlers from New Jersey. Hostile Indians at that time rendered the navigation of the Ohio difficult and dangerous, and its progress for many years was slow. After the introduction of steam it grew rapidly. Though saved from the inroads of slavery by the ordinance of 1787, its proximity to, and its social and commercial relations with, the slave states, induced among its inhabitants an inveterate opposition to every scheme of emancipation. From 1831 to 1838, the public discussion of slavery there was hardly less odious and dangerous than it was in New

Orleans and Richmond. Two or three times an anti-slavery press established there by James G. Birney was destroyed by a mob, with the open and avowed sanction of eminent citizens and the connivance of the city government. The excuse urged for these outrages was that C. depended for her prosperity largely upon her trade with the slave states, and that this trade could not be retained if an anti-slavery journal were tolerated. The city was a rendezvous and a thoroughfare for fugitive slaves on their flight to Canada, and thus served to keep the people in a state of constant fermentation. Levi Coffin, a Quaker citizen of the place, who lately died at an advanced age, was proud to declare that he had harbored no less than 3,000 of these fugitives, not one of whom failed to make good his escape. A large proportion of the population, moreover, were natives of the south, and therefore in natural sympathy with the region whence they had emigrated. So strong was this sympathy in 1862, when an attack by a confederate force was expected, that it was deemed necessary to put the city under martial law. These memories, however unpleasant, are a part of the history of a period now happily passed away. See *Supp.*, page 897.

CINCINNATI (the Cincinnatuses), a society or order in the United States of North America, established by the officers of the revolutionary army in 1783, "to perpetuate their friendship, and to raise a fund for relieving the widows and orphans of those who had fallen during the war." It was so named because it included patriots, headed by Washington, who in many instances had left rural affairs to serve their country (see CINCINNATUS). The badge of the society is a bald eagle suspended by a dark-blue ribbon with white borders, symbolizing the union of France and America. On the breast of the eagle there is a figure of Cincinnatus receiving the military ensigns from the senators, with the plow in the background; round the whole are the words, *Omnia reliquit servare rempublicam.* On the reverse, the same hero is represented crowned by fame with a wreath on which is inscribed *virtutis præmium*, etc. As this distinction was made hereditary, it was attacked as opposed to republican equality. Franklin saw in it the germ of a future aristocracy, and at a meeting held in Philadelphia in 1784, several changes were made in the constitution of the society, and in several of the states it was quietly abolished. There are still, however, several state societies, which hold a general meeting by delegates triennially.

CINCINNATI, SOCIETY OF THE (*ante*). At the second general meeting, in 1787, Washington was elected president-general, and was re-elected every third year during his life. His successors in office were Alexander Hamilton and the Pinckneys; and when Lafayette visited the country in 1824, he was its only surviving maj.gen. The last survivor of the original association was Robert Burnet, of New York, who died in 1854. The society now exists but in four or five states. Hamilton Fish, ex-secretary of state, is the presiding officer, and the largest gatherings are at the annual meetings in New York city. Nearly all the prominent generals in the U. S. army have been or are now members of the society. It has been thought or charged that the society has some political partisan significance or inclination, but this is not the fact. The Tammany society, which is aggressively partisan, was started to oppose the society of the Cincinnati, because the latter was supposed to be established in the interest of the wealthier and more aristocratic classes.

CINCINNAT'US, LUCIUS QUINCTIUS, a Roman consul, regarded by the later Romans as the model of antique virtue and simple manners. So far as we can discern his character through the veil of legend, C. appears to have been a violent patrician. About 460 B.C., he was chosen consul, and two years later was made dictator. When the messengers from Rome came to tell C. of his new dignity, they found him plowing on his small farm. He soon rescued the consul Lucius Minucius, who had been defeated and surrounded by the Æqui. Livy's account of the mode in which the deliverance was effected is rejected by Niebuhr, who points out the inconsistencies and impossibilities of the story, and seems disposed to regard the whole as a mere myth. We are next informed that, after a dictatorship of sixteen days, C. returned to his small farm on the Tiber. When 80 years old, he was once more made dictator (439 B.C.), and suppressed a threatened plebeian insurrection.

CINDER-BED, a name given by the quarrymen to a stratum of the Upper Purbeck series, almost entirely composed of the loosely aggregated shells of a small oyster (*ostrea distorta*).

CIN'EAS, the chief adviser of Pyrrhus, king of Epirus. His most famous work was in visiting Rome, to arrange for peace, after the defeat of the Romans in 280 B.C. In Rome, he learned in a single day the name of every man of importance in the city. He was not successful in securing peace, and when he returned he told Pyrrhus that Rome was a temple and its senate an assembly of kings.

CINERA'RIA, a genus of plants of the natural order *compositæ*, sub-order *corymbiferæ*, very nearly allied to *senecio* (groundsel, ragwort, etc.), from which it differs only in having the involucre formed of one row of equal erect scales. The species are numerous, and widely diffused over the world in very various climates. They are annual or perennial herbaceous plants; with simple, generally toothed or sinuate leaves. Many of them are remarkable for the ashy appearance of the lower part of

the leaves, whence their name (Lat. *cinis, -eris*, ashes). The leaves are often covered with a peculiar sort of down. Two small species are natives of the southern parts of Britain. The flowers of some are very pretty. *C. maritima*, a native of the s. of Europe, and other species, have for some time been much cultivated in gardens and green-houses. Many hybrids and varieties have been produced by cultivation.

CIN'ERARY URNS (Lat. *cinis*, ashes) were used by the nations of antiquity to contain the ashes of the dead when gathered from the funeral pile. Previous to being deposited in the urn, the embers were soaked with wine; the urn was then placed in a niche in the family mausoleum. Only the wealthy could afford so expensive a rite. C. U. were either sculptured in marble, or formed of clay or glass. They were not always in the form in which we commonly see them represented on modern tombs. The celebrated cinerary urn known by the name of the Portland or Barberini vase, preserved in the British museum, a beautiful production of Greek art, was discovered about the middle of the 16th c., in a marble sarcophagus in a sepulcher (believed to be that of the Roman emperor Alexander Severus, 223–235 A.D.) at Monte del Grano, near Rome. The height of the urn is 10 inches. One of the finest specimens yet discovered in the British isles, is preserved in the museum of the royal Irish academy. It was found in a small stone chamber near Bagnalstown, co. of Carlow. It is composed of very fine clay, and is but $2\frac{1}{3}$ in. high. It contained the burnt bones of an infant or very young child.

CINI'SI, a t. of Sicily, in the province of Palermo, 14 m. w.n.w. of Palermo, near the coast. It is a neat, cheerful town, with straight, regular streets, and has 6,714 inhabitants. The Benedictine convent here was once a feudal castle.

CIN'NA, LUCIUS CORNELIUS, a Roman noble, was one of the principal supporters of the faction of Marius. After Sulla had driven Marius from the city, and before setting out on his expedition against Mithridates, he allowed C. to be elected to the consulship. But C. had no sooner entered upon that office (87 B.C.), than he impeached Sulla, endeavored to form an interest among the citizens who had been added to Rome after the social war, and agitated for the recall of Marius. The events which led to the return of Marius are stated in the article Marius (q.v.). After a cruel massacre of the Roman citizens, in which some of the most eminent statesmen and orators were slain, Marius and C. declared themselves consuls. On the death of Marius, which occurred within a few days of his usurpation, C. made L. V. Flaccus his colleague for that year, and C. P. Carbo for the two succeeding years. In 84 B.C., he prepared to meet Sulla, who was then on his way from the east to take vengeance upon his enemies, but was slain by his disaffected troops at Brundusium. During his fourth consulate, his daughter Cornelia had been married to Julius Cæsar.

CIN'NABAR, an ore of mercury, from which almost all the mercury of commerce is obtained. Chemically, it is a bisulphuret of mercury, containing 86.2 parts of mercury and 13.8 of sulphur. It occurs both crystallized and massive, not unfrequently disseminated. Its crystals are six-sided prisms. It varies from perfectly opaque to almost transparent; has an adamantine almost metallic luster, and a carmine color, with a bright scarlet streak. Its specific gravity is 8 to 8.2. *Hepatic C.*, so called from its liver-brown color, is a variety containing a little carbon. C. sometimes occurs in primitive rocks, but more frequently in those of the coal formation, and is sometimes even intimately mixed with coal itself. It is, however, a rare mineral, and is nowhere found in Britain. The C. mines of Almaden, in Spain, have been worked for about 2,300 years, and are still the most productive in the world. At Almaden, the C. is found in a dark-colored slate mixed with quartzite. Next to the mines of Almaden, rank those of Idria in Carniola. C. mines exist also in Germany, Hungary, Peru, California, China, Japan, etc. C. is used as a pigment under the name of *vermilion*.

CINNAM'IC ACID AND THE **CINNAMYL SERIES.** Cinnamyl is a compound radical, as yet unisolated, which is represented by the formula $C_{18}H_7O_2$, and which includes amongst its compounds cinnamic acid ($C_{18}H_7O_3,HO$), oil of cinnamon, which is chemically a slightly impure aldehyde of cinnamic acid, or a hydride of cinnamyl ($C_{18}H_7O_2,H$), chloride of cinnamyl ($C_{18}H_7O_2,Cl$), styrone or peruvine, known chemically as cinnamic alcohol ($C_{18}H_{10}O_2$), cinnamol and styrol, each represented by the formula $C_{16}H_8$, and styracin ($C_{18}H_{16}O_4$). We shall briefly notice the most important of these compounds—viz., cinnamic acid and oil of cinnamon. *Cinnamic acid* ($C_{18}H_8O_4$) crystallizes in colorless prisms, which are sparingly soluble in cold water, but dissolve readily in boiling water, alcohol, and ether. It fuses at 266°, and boils with or without decomposition, according to the manner in which it is heated, at about 570°. It is converted by most decomposing agents into benzoyl compounds, such as benzoic acid, oil of bitter almonds, etc.; for example, when fused with hydrate of potash, it assimilates the elements of water, and breaks up into acetic and benzoic acids; when boiled with peroxide of lead, it is converted into oil of bitter almonds and benzoic acid, etc. It exists naturally in a free state in liquid storax, the balsams of Tolu and Peru, and gum benzoin, and is often deposited in large crystals from old samples of oil of cinnamon and from cinnamon water. It is always formed from oil of cinnamon when the latter is exposed to the action of the air, and it has been synthetically or artificially formed by exposing equivalent quantities of chloracetyl ($C_4H_3O_2Cl$)

and oil of bitter almonds ($C_{14}H_6O_2$) to a prolonged heat in a closed glass tube. *Oil of cinnamon* and *oil of cassia*, although prepared from different kinds of trees, are virtually identical in their composition, each consisting mainly of cinnamic aldehyde, or hydride of cinnamyl, mixed with certain resinous matters. Oil of cinnamon is an article of the materia medica, and in doses of one minim to a five-grain pill, forms an excellent aromatic addition to cathartic pill-masses.

CIN'NAMON is the spicy, aromatic, and stimulating bark of certain species of the genus *cinnamomum*. This genus belongs to the natural order *lauraceæ*, and was formerly included in *laurus*. It contains a considerable number of species, natives of tropical and subtropical parts of the east. C. has been in use from the remotest antiquity. It is mentioned in the Old Testament, and by a name almost the same as that which it still bears in most languages. The finest kind is said to be chiefly produced by *cinnamomum zeylanicum* (formerly, *laurus cinnamomum*), which chiefly grows in the island of Ceylon, although, having been introduced into the West Indies in 1782, along with various other plants of the east, it is now cultivated there to some extent. The tree attains the height of 20 to 30 ft., and is sometimes 1½ foot in thickness. Its bark is of a grayish-brown color, internally of a yellowish red. The leaves are oval, 4 to 6 in. long, with a blunt point, and marked with three principal nerves. They have the taste of cloves. The flowers are of a silky gray on the outside, and a pale-yellowish color internally. The fruit is somewhat like an acorn in shape; it is a small drupe, brown when ripe. There are two seasons of cinnamon-harvest in Ceylon, the first commencing in April, and the last in Nov.—the former being that in which the chief crop is obtained. The branches of 3 to 5 years' growth being cut down, the epidermis is scraped away; the bark is then ripped up longitudinally with a knife, and gradually loosened, till it can be taken off. The slices are then exposed to the sun, when, as it dries, it curls up into *quills*, the smaller of which are inserted into the larger, and the whole tied up in bundles of about 88 lbs. each. C. is examined and arranged according to its quality by persons who are obliged for this purpose to taste and chew it, although in a short time it produces painful effects on their mouths and tongues. The finest C. is yielded by the young branches of the tree, especially by the numerous shoots which spring up from the stump after a tree has been cut down, and which are cut when about 10 ft. long, and of the thickness of an ordinary walking-stick. The smell, particularly of the thinnest pieces, is delightfully fragrant, and the taste pungent and aromatic, with a mixture of sweetness and astringency. It is used like other spices by cooks and confectioners, and also in medicine as a tonic, stomachic, and carminative. The average quantity annually imported into London is about 500,000 lbs. Its virtues depend chiefly upon the essential oil which it contains (*oil of cinnamon*). Oil of cassia is very often substituted for this oil, as cassia—which, however, may readily be distinguished by its mucilaginous taste—is for cinnamon. The root of the cinnamon-tree contains camphor. The fruit yields a concrete oil, called *cinnamon suet*, which is highly fragrant, and in Ceylon was formerly made into candles, for the exclusive use of the king.—Cassia (q.v.) is the produce of another species of *cinnamomum.—C. loureirii*, a native of Cochin China and Japan, is said to yield a bark even superior to that of *C. zeylanicum*. A species of C., which ascends to the elevation of 8,500 ft. in the Sikkim Himalaya, deserves a trial even in the climate of Britain.

The constituents of C. are a volatile oil (*oil of C.*), tannin, starch, mucilage, woody-fiber, resin, coloring matter, and an acid. The oil of C. is generally prepared in Ceylon by grinding the coarsest pieces of C., soaking them in sea-water for two or three days, and then distilling. Two oils pass over, one lighter, the other heavier than water. Oil of C. varies in color from yellow to cherry-red, the yellow variety being considered the best, and is most highly esteemed. *Oil of C. leaf* is prepared from the leaves in Ceylon by a similar process, and is met with in commerce under the name of *clove oil*, which it much resembles in odor. *C. water* is obtained by adding water to C., and distilling a large quantity, or by diffusing the *oil of C.* through water by the aid of sugar or carbonate of magnesia. *Spirit of C.* is procured by acting upon C. with spirit of wine and water, and distilling; and *tincture of C.*, by soaking C. in spirit of wine, and straining. The medicinal properties of C., and its preparation, are aromatic and carminative, and it is serviceable in cases of nausea and vomiting, and in cases of flatulence and spasmodic states of the stomach and alimentary canal.

CINNAMON-STONE, a precious stone, of which the finer specimens are highly esteemed; it is regarded as a variety of garnet (q.v.). Its color varies from hyacinth red to orange yellow; and when pure, it is transparent. It is composed essentially of silica, alumina, and lime. It is found chiefly in Ceylon, where vast bowlders of gneiss containing it in profusion exist in many places.

CIN'NYRIS. See SUN-BIRDS.

CINQUÉ CEN'TO (Ital.), five hundred. A technical, or rather *slang* artistic term, used to designate the style of art which arose in Italy after the year 1500, and which therefore belongs to the 16th c.; i.e., after the fall of all the great schools. It is sensuous in its character, the subjects chosen being usually borrowed from heathen mythology or history

CINQUE'FOIL, in botany. See POTENTILLA.

CINQUEFOIL, a common bearing in heraldry. It is usually depicted with the leaves issuing from a ball as a center point.—C., in architecture, is an ornamental foliation in five compartments, used in the tracery of windows, panelings, and the like. The C. is often represented in a circular form, the spaces between the points or cusps representing the five leaves.

The C. of heraldry and of architecture is not derived from any leaf of five leaflets, but, as its perfect regularity of form indicates, from the flower of the plant called C. (*potentilla*), or other similar flower of five petals or *leaves*. The C. thus closely resembles the rose, with which it would, indeed, be identified, but that a double and not a single rose is chosen for the purposes of heraldry and decorative art.

CINQUE' PORTS (Fr. five ports). It is said that the five maritime ports of England lying opposite to the coast of France—Sandwich, Dover, Hythe, Romney, and Hastings—were enfranchised in the time of Edward the confessor. But it was subsequent to the battle of Hastings that the conqueror, in order that he might wield the resources of the seaports with greater vigor, constituted this whole line of coast into a jurisdiction entirely separate from the counties of Kent and Sussex, and erected it into a sort of county palatine, under a warden or guardian, the seat of whose administration was in Dover Castle. The warden, whose office corresponded to that of the ancient count of the Saxon coast (*comes littoris Saxonici*), exercised jurisdiction, civil, military, and naval, uniting in his single person the functions of sheriff, custos rotulorum, lord-lieutenant, and admiral. Privileges equal to those originally bestowed on the C. P. were subsequently extended to the so-called *ancient towns* of Winchelsea and Rye, and most of the municipal towns had subordinate ports and towns attached to them, which were called *members*. In place of the Saxon terms of *aldermen* and *freemen*, those of *jurats* and *barons* were introduced, and the latter term has always been applied to the representatives of the C. P. in parliament. The chief function performed by the C. P. in early times consisted in furnishing such shipping as was required for the purposes of the state, the crown having possessed no permanent navy previous to the reign of Henry VII. In the time of Edward I., they were bound to provide no less than 57 ships, fully equipped and manned at their own cost; though the weight of this heavy burden was somewhat lessened by the provision, that the period of gratuitous service should be limited to 15 days. In consequence of the warlike navy which they were thus compelled to maintain, the C. P. became so confident in their strength, and so insolent and audacious, as not only to undertake piratical expeditions, but even to make war and form confederacies as independent states. Previous to the revolution of 1688, the lord-wardens were in use to nominate the barons, or parliamentary representatives of the C. P.; but in 1689, an act was passed to "declare the right and freedom of election of members to serve in parliament for the cinque ports." The reform bill of 1832 reduced the number of members sent to parliament by the C. P. from 16 to 8, and the municipal reform act has broken up the ancient organization of the ports, and assimilated their internal arrangements to those of other English municipalties. The ancient courts of Stepway, Brotherhood, and Guestling are still occasionally held, but their powers scarcely extend beyond matters of form, such as appointing the barons, who are to exercise an ancient privilege of the ports, which consists in carrying the canopy over the sovereign's head at a coronation. The lord-warden's jurisdiction, in relation to civil suits and proceedings, was abolished by 18 and 19 Vict. c. 48, amended by 20 and 21 Vict. c. 1.

CIN'TRA, a small but picturesquely situated town in Portugal, in the province of Estremadura, about 15 m. w.n.w. of Lisbon, with a pop. of 4,000. It stands on the declivity of the Sierra de Cintra, and is surrounded by country residences. There is a palace at C., a strange mixture of Moorish and Christian architecture, anciently occupied by the Moorish kings, and subsequently a favorite residence of the Christian monarchs. A charming view of the town and of the sea is to be had from the top of a hill crowned with the ruins of a Moorish castle. On another hill-top stands La Penna, once a convent, now a residence of the king of Portugal, who has restored and given it the outward appearance of a feudal castle. In the neighborhood, also, is what is called the Cork convent, which derives its name from the cells—which are cut out in the rock—being lined with cork to prevent damp.

C. is historically remarkable for the *convention* concluded here, Aug. 22, 1808, between the English and French, by which the latter agreed to evacuate Portugal. Junot had been defeated by sir Arthur Wellesley at Vimieira, and had retreated towards Torres Vedras and Lisbon, whither the English under sir Hew Dalrymple, who had just arrived and assumed the chief command, were preparing to follow them. But the French, despairing of finally holding out, agreed to evacuate the country, on condition of not being treated as prisoners of war, but landed on the coast of France, retaining their arms and effects. This convention excited the greatest public indignation both in the Peninsula and in England. Several English newspapers appeared in mourning, and the ministry were obliged to have the generals who signed the convention tried by a court-martial, which, however, resulted in their acquittal. In fact, though the terms of the convention might be advantageous for the French, to obtain immediate possession

of Portugal and Lisbon, instead of being put to the necessity of a bloody siege for months, was no less advantageous to the English and their allies. Such, at least, was the opinion of two competent judges—Napoleon and Wellington.

CIO'NE, ANDREA DI. See ORCAGNA.

CIOTAT, LA, a t. of France, in the department of Bouches-du-Rhone, situated on the w. side of a bay in the Mediterranean, about 15 m. s.e. of Marseilles, in the midst of a district clad with olive, orange, and pomegranate plantations. It is well built and has a good and commodious harbor, formed by a mole, and well defended. The industry consists in cotton-spinning, ship-building, and an active trade in the produce of the district. Pop. '72, 8,232.

CI'PHER, an ornamental arrangement of the initial letters of a name, by which they become also a private mark, adopted by artists and architects as distinctive of their work. That of Albrecht Dürer is well known.

CI'PHER-WRITING. See CRYPTOGRAPHY.

CIPRIA'NI, GIAMBATTISTA, painter and copper-engraver, was b. in Florence, 1732, or, according to others, in 1727, and when 19 years old, went to Rome, where he chose Correggio as a model, and soon gained a high reputation. Invited by certain English residents in Rome, the artist came to London about 1754, where he was one of the first members of the royal academy (founded 1769) and died in 1785. His drawing is correct, his coloring harmonious, his heads have grace and loveliness, and the general style of his works is attractive, although exceedingly conventional. A series of small copper-plate illustrations of *Orlando Furioso* well exemplifies his graceful style. Several of Bartolozzi's best engravings are in C.'s manner.

CIRCÆ'A (from *Circe*, q.v.), a genus of rather pretty little herbaceous plants of the natural order *Onagraceæ*, with a deeply 2-cleft calyx, a corolla of two petals, and two stamens. *C. lutetiana* is frequent in shady situations in Britain, and in most parts of the continent of Europe. It bears the English name of ENCHANTER'S NIGHTSHADE, and in Germany it is called Hexenkraut (witches' herb). The origin of such names is not easily explained. The plant possesses no remarkable properties, being merely a little astringent. Other species are found in the Himalayas, etc.

CIRCAR, an Indian term applied to the component parts of a province, each of which is administered by a deputy governor. In English, it is principally employed in the name of the Northern Circars, used to designate a now obsolete division of the Madras presidency, which consisted of a narrow slip of territory lying along the w. side of the bay of Bengal, from 15° 40′ to 20° 17′ north. These Northern Circars were Cicacole, Rajahmundry, Ellore, Condapilly, and Guntoor, in all 30,000 sq. miles.

CIRCASSIA, a division of the Western Caucasus, comprising the n., and also a portion of the s. slope of that mountain-range extending in lat. 42° to 45° n., and long. 37° to 47° east. See CAUCASUS.

CIRCASSIANS, in the wide sense of the term, is the name given to all the independent tribes of the Caucasus; in a narrower sense, it denotes the tribes who inhabited the western part of the range which is called, in consequence, Circassia. The C. proper, however, occupied only the s.w. wing of the Caucasus, with the exclusion of Abasia, or the portion between the Black sea in the w. and the lower bank of the river Kuban in the north. They call themselves Adighé, but the Russians and Turks call them *Tcherkesses*. On their conquest by Russia in 1864, rather than remain in subjection to that power they chose to emigrate to Turkey, and from 400,000 to 500,000, or nearly the whole nation of 15 tribes, carried this resolution into effect. The greater part of them were distributed over the Turkish possessions in Asia Minor, but others were settled in the mountainous parts of Bulgaria and on the borders of Servia. In their original country they were a marauding and warlike people, amongst whom it was held more honorable to live by plunder than by peaceful industry. In common with all brigand tribes, the C. cherished the most unrestrained love of independence. Their government was a singular compound of constitutionalism and feudalism. There were five distinct ranks in the nation—viz., chiefs or princes, nobles, common freemen, dependants, and slaves. The class of common freemen made up the great mass of the people; they possessed property, and enjoyed the same political rights as the nobles. The fourth class, the dependants, were the vassals of the princes and nobles, whose lands they cultivated, and whose armies they formed. Yet their lord had no right over their persons; for in some cases they and their whole families left him; and they could only be sold as slaves for punishment according to the previous verdict of a national assembly. The fifth class comprised the slaves, or those who had been made captive in war. That the C. have not lost some of the worst traits of their natural character since their settlement in Turkey is shown by their participation in the Bulgarian massacres of 1876 and 1877.

The C. princes and nobles are principally Mohammedans, whilst the great mass of the people have a religion which is a kind of mixture of Christianity and paganism, in which the celebration of Easter, the sign of the cross, sacred trees, sacrifice, and processions with lights, play an important part. Besides agriculture and the raising of cattle, they possess a few other branches of industry. The C. are proverbially handsome;

they are also strong, active and temperate, and are characterized by the higher attributes of self-dependence, courage, and prudence. As a nation they made their first historical appearance during the middle ages. They are, however, chiefly known through their long struggles to maintain their independence against the aggression of Russia. See CAUCASUS. For their place in ethnology, see CAUCASIAN VARIETY OF MANKIND.

CIRCÉ, a fabulous sorceress, is described by Homer as "fair-haired, a clever goddess, possessing human speech," sister of "all-wise Æætes," daughter of "the Sun, who gives light to mortals, and of Perse, whom Ocean begot as his daughter." Round her palace in Ææa were numbers of human beings, whom she had changed into the shapes of wolves and lions by her drugs and incantations. She changed two-and-twenty of the companions of Ulysses into swine, but that hero, having obtained from Mercury the herb *moly*, went boldly to the palace of the sorceress, remained uninjured by her drugs, and induced her to disenchant his comrades. He remained with her for a year; and when he departed, she instructed him how to avoid the dangers which he would encounter on his homeward voyage (*Odyssey*, books x. and xii.). Jealous of Scylla, whose love was sought by Glaûcus, she poured the juice of poisonous herbs into that part of the sea where her rival was accustomed to bathe, and changed her into a hideous monster (*Metamorphoses*, book xiv., fables 1 and 6).

CIRCE'II, a t. of ancient Italy, in Latium, at the foot of Mons Circeius, a short distance from the sea, 10 or 12 m. from Terracina. Its ruins are still visible on the Monte-della Cittadella, and consist of walls and gateways, built of polygonal blocks.

CIRCENSIAN GAMES. See CIRCUS, *ante*.

CIRCLE, a plane figure bounded by a curved line, which returns into itself, called its *circumference*, and which is everywhere equally distant from a point within it called the *center* of the circle. The circumference is sometimes itself called the C., but this is improper; C. is truly the name given to the space contained within the circumference. Any line drawn through the center, and terminated by the circumference, is a *diameter*. It is obvious that every diameter is bisected in the center. (See ARC, CHORD.) In co-ordinate geomctry, the C. ranks as a curve of the second order, and belongs to the class of the conic sections. It is got from the right cone by cutting the cone by a plane perpendicular to its axis. The C. may be described mechanically with a pair of compasses, fixing one foot in the center, and turning the other round to trace out the circumference. The C. and straight line are the two elements of plane geometry, and those constructions only are regarded as being properly geometrical which can be effected by their means. As an element in plane geometry, its properties are well known and investigated in all the text-books. Only a few of the leading properties will here be stated.

1. Of all plane figures, the C. has the greatest area within the same perimeter.

2. The circumference of a C. bears a certain constant ratio to its diameter. This constant ratio, which mathematicians usually denote by the Greek letter π, has been determined to be 3.14159, nearly, so that, if the diameter of a C. is 1 foot, its circumference is 3.14159 feet; if the diameter is 5 ft., the circumference is 5×3.14159; and, in general, if the diameter is expressed by $2r$ (twice the radius), then c (circumference) $= 2r \times \pi$. Archimedes, in his book *De Dimensione Circuli*, first gave a near value to the ratio between the circumference and the diametcr, being that of 7 to 22. Various closer approximations in large numbers were afterwards made, as, for instance, the ratio of 1815 to 5702. Vieta, in 1579, showed that if the diameter of a C. be 1000, etc., then the circumference will be greater than 3141.5926535, and less than 3141.5926537. This approximation he made through ascertaining thc pcrimeters of the inscribed and circumscribed polygons of 393,216 sides. By increasing the number of the sides of the polygons, their perimeters are brought more and more nearly into coincidence with the circumference of the circle. The approximation to the value of π has since been carried (by M. de Lagny) to 128 places of figures. It is now settled that π belongs to the class of quantities called *incommensurable* (q.v.), i.e., it cannot be expressed by the ratio of any two whole numbers, however great. In general, it may be considered that 3.14159 is a sufficiently accurate value of π.

Though the value of π was at first approached by actually calculating the perimeter of a polygon of a great number of sides, this operose method was long ago superseded by modes of calculation of a more refined character, which, however, cannot here be explained. Suffice it to say, that various series were formed expressing its value; by taking more and more of the terms of which into account, a closer and closer approach to the value might be obtained. We subjoin one or two of the more curious.

$$\pi = 4\left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \text{etc.}\right).$$

$$\pi = 8\left(\frac{1}{1.3} + \frac{1}{3.5} - \frac{1}{3.5.7} + \frac{1}{5.7.9} - \frac{1}{7.9.11} + \frac{1}{9.11.13} - \text{etc.}\right).$$

3. The area of a C. is equal to π multiplied by the square of the radius ($=\pi r^2$); or to the square of the diameter multiplied by $\frac{\pi}{4}$; i.e., by .7854. Euclid has proved this

by showing that the area is equal to that of a triangle whose base is the circumference, and perpendicular height the radius of the circle.

4. It follows that different circles are to one another as the squares of their radii or diameters, and that their circumferences are as the radii or diameters.

The C. is almost always employed to measure angles, from its obvious convenience for the purpose, which depends on the fact demonstrated in Euclid (book iv. prop. 33), that angles at the center of a C. are proportional to the arcs on which they stand. It follows, from this, that if circles of the same radii be described from the vertices of angles as centers, the arcs intercepted between the lines, including the angles, are always proportional to the angles. The C. thus presents us with the means of comparing angles. It is first necessary, however, to graduate the C. itself; for this purpose its circumference is divided into four equal parts, called *quadrants*, each of which obviously subtends a right angle at the center, and then each quadrant is divided into degrees, and each degree into minutes, and so on. The systems of graduation adopted are various, and will now be explained.

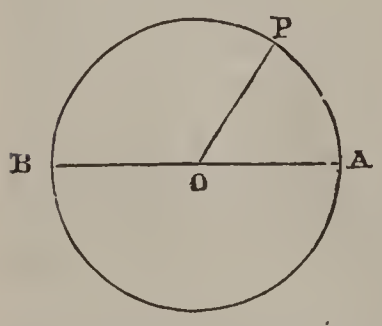
The sexagesimal scale is that in common use. According to it, each quadrant or right angle being divided into 90 *degrees*, each degree is divided into 60 seconds, and each second into 60 thirds, and so on. According to this scale, 90° represents a right angle; 180°, two right angles, or a semicircle; and 360°, four right angles, or the whole circumference—the unit in the scale being the $\frac{1}{90}$th of a right angle. As the divisions of the angles at the center, effected by drawing lines from the center to the different points of graduation of the circumference, are obviously independent of the magnitude of the radius, and therefore of the circumference, these divisions of the circumference of the C. may be spoken of as being actually divisions of angles. By laying a graduated C. over an angle, and noticing the number of degrees, etc., lying on the circumference between the lines including the angle, we at once know the magnitude of the angle. Suppose the lines to include between them 3 degrees, 45 minutes, 17 seconds, the angle in this scale would be written 3° 45′ 17″.

It is obvious, however, that the division of the quadrant into 90 degrees instead of any other number, is quite arbitrary. We may measure angles by the C., however we graduate it. Many French writers, accordingly, have adopted the

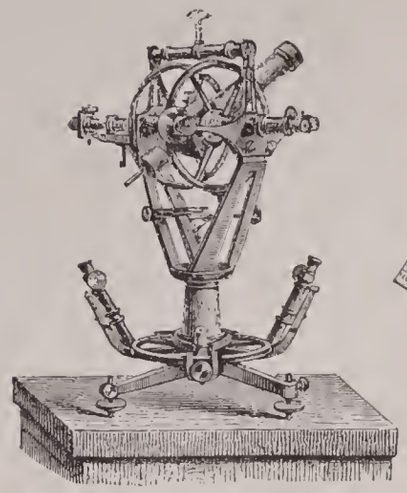
Centesimal Division of the Circle.—In this division, the right angle is divided into 100 degrees, while each degree is divided into 100 parts, and so on. This is a most convenient division, as it requires no new notation to denote the different parts. Such a quantity as 3° 45′ 17″ is expressed in this notation by 3.4517, the only mark required being the decimal point to separate the degrees from the parts. Of course, in this illustration, 3° means 3 centesimal divisions of the right angle, and 45′ means 45 centesimal minutes, and so on. If we want to translate the quantity 3° of the common notation into the centesimal notation, we must multiply 3 by 100, and divide by 90. To translate minutes in the common notation into the centesimal, the rule is to multiply by 100, and divide by 54.

There remains yet another mode of measuring angles, known as the

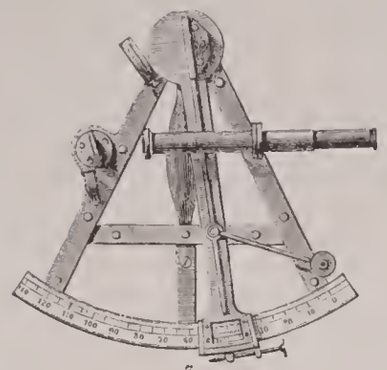
Circular Measure.—The circular measure of angles is in frequent use, and depends directly on the proposition (Euc. vi. 33), that angles at the center of a C. are proportional to the arcs on which they stand. Let POA be an angle at the center O of a C., the radius of which is r; APB a semicircle whose circumference accordingly $= \pi r$; and let the length of the arc AP $= a$. Then, by Euclid, $\frac{\text{angle POA}}{\text{2 right angles}} = \frac{a}{\pi r}$; and



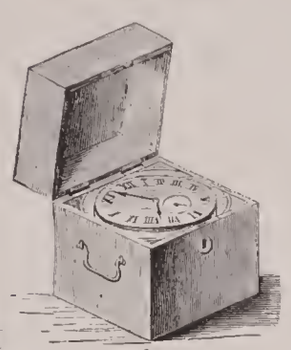
$\angle$ POA $= \frac{\text{2 right } \angle\text{s}}{\pi} . \frac{a}{r}$. Now, supposing a and r to be given, although the angle POA will be determined, yet its numerical value will not be settled unless we make some convention as to what angle we shall call unity. We are free to make any convention we please, and therefore choose such a one as will render the preceding equation the most simple. It is made most simple if we take $\frac{\text{2 right angles}}{\pi} = 1$. We shall then have (denoting the numerical value of the angle POA by θ) $\theta = \frac{a}{r}$. The result of our convention is, that the numerical value of two right angles is π, instead of 180°, as in the method of angular measurement first alluded to; and the unit of angle, instead of being the ninetieth part of a right angle, is $\frac{\text{2 right angles}}{\pi}$, or 57° 17′ 44″ 48‴ nearly. Making $\theta = 1$ in the equation $\theta = \frac{a}{r}$, we have a (or AP) $= r$ (or AO), which shows that in the circular measure, the unit of angle is that angle which is subtended by an arc of length equal to radius. It is frequently a matter of indifference which mode of measuring angles is adopted; the circular measure, however, is generally the most advantageous, as being the briefest. It is easy to pass from this mode of measurement to the sexagesimal. If



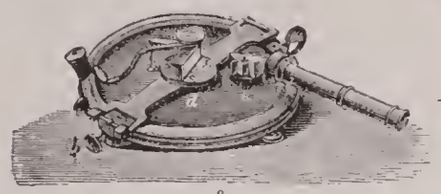
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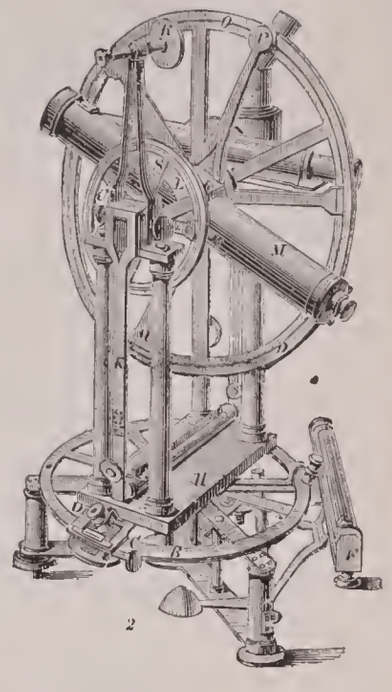
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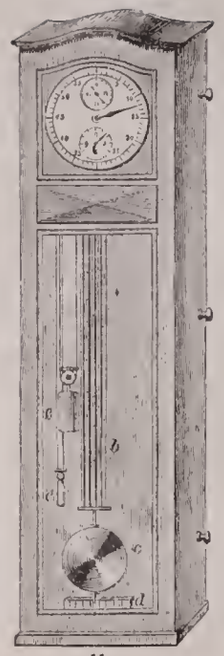
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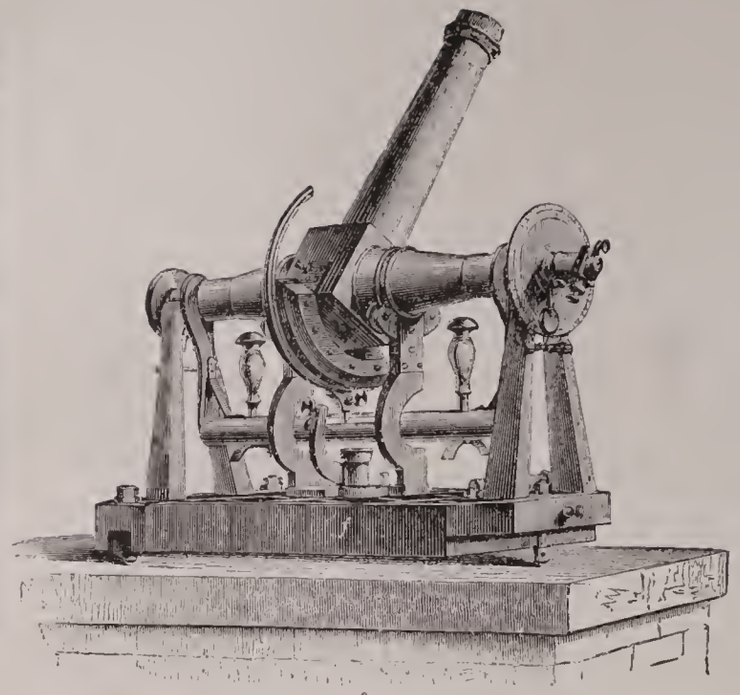
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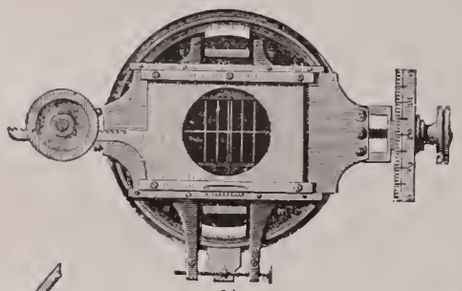
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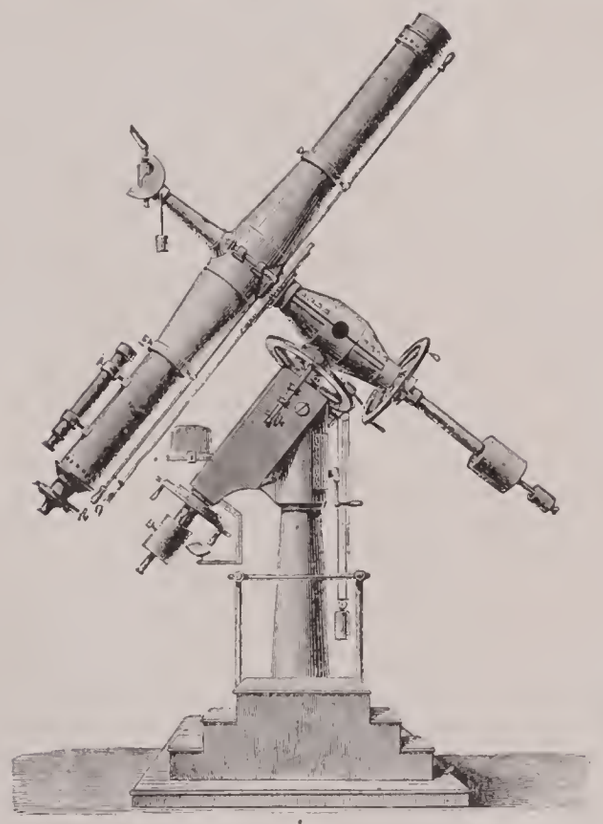
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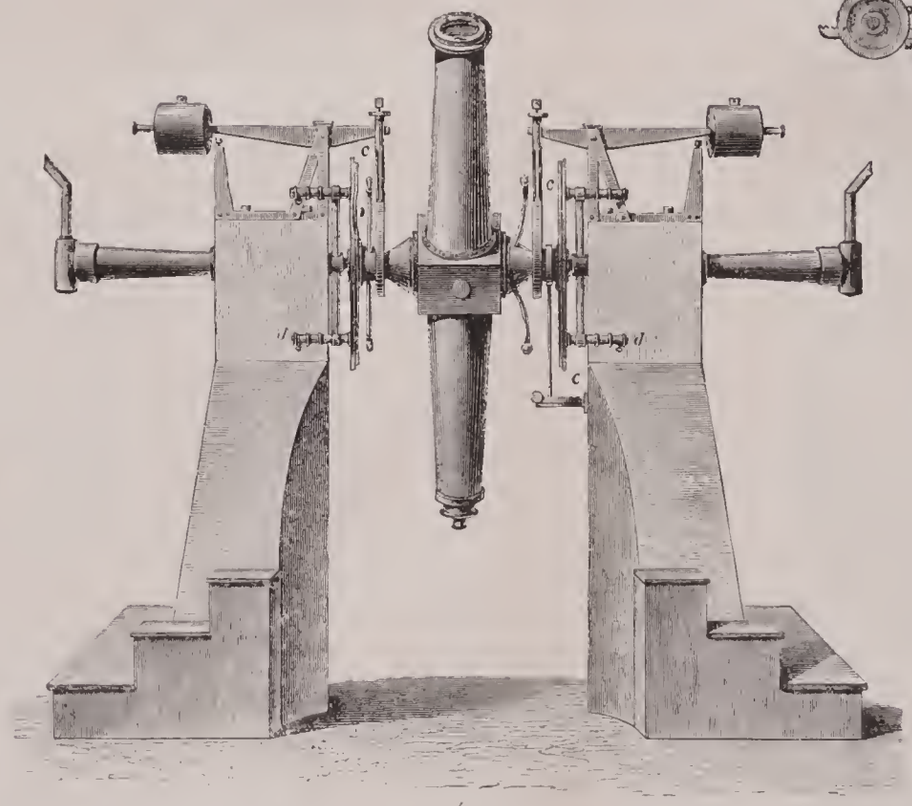
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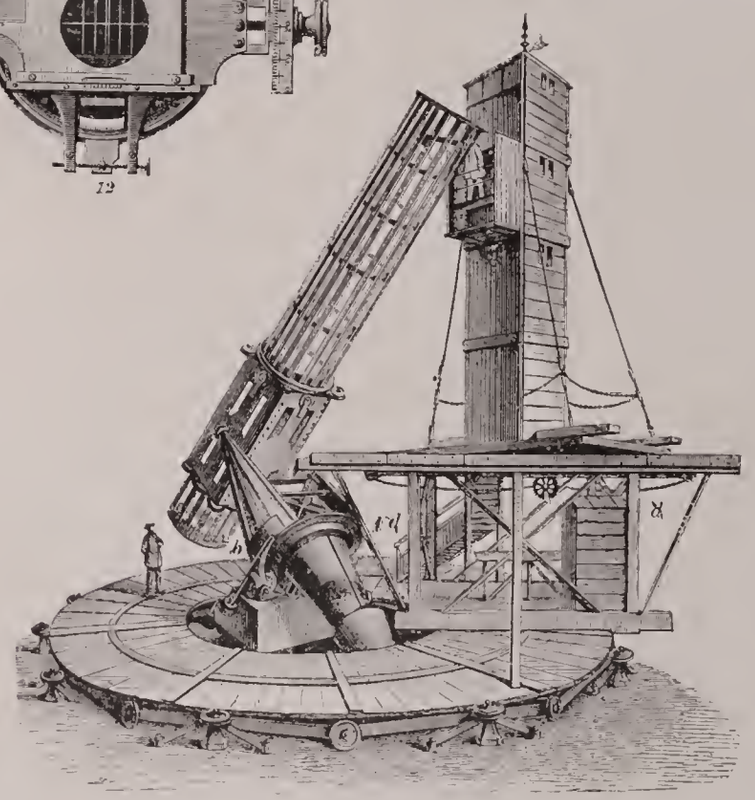
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CIRCLE, MERIDIAN, ETC.—1. Universal instrument. 2. Transit instrument. 3. Passage instrument. 4. Equatorial. 5. Meridian circle. 6. Lassel's reflecting telescope. 7. Reflecting sextant. 8. Reflecting circle. 9. Box-chronometer. 10. Pendulum with mercury compensation. 11. Astronomical clock. 12. Micrometer.

θ be the circular measure of an angle, the angle contains $\frac{\theta}{\pi} . 180°$; conversely, if an angle contain $n°$, its circular measure is $\frac{n}{180} . \pi$.

CIRCLE, Magic, a space in which sorcerers were wont, according to the ancient popular belief, to protect themselves from the fury of the evil spirits they had raised. This C. was usually formed on a piece of ground about 9 ft. square (in the east, 7 ft. appears to have been considered sufficient), in the midst of some dark forest, churchyard, vault, or other lonely and dismal spot. The C. was described at midnight in certain conditions of the moon and weather. Inside the outer C. was another somewhat less, in the center of which the sorcerer had his seat. The spaces between the circles, as well as between the parallel lines which inclosed the larger one, were filled "with all the holy names of God," and a variety of other characters supposed to be potent against the powers of evil. Without the protection of this C., the magician, it was believed, would have been carried off by the spirits, as he would have been, had he by chance got out of the charmed space.

CIRCLE, Mural, an instrument used for determining the meridian altitude or zenith distance of a star. It consists of an astronomical telescope firmly fixed to a graduated circle, which moves about a horizontal axis, fixed in a strong vertical wall running north and south. In the common focus of the eye-piece and object-glass of the telescope is a system of cross-wires (spider lines are generally used for the purpose), one being horizontal, and five vertical, with equal spaces between. The line joining the optical center of the object-glass with the intersection of the horizontal and middle vertical wires, is called the line of *collimation* of the telescope, and when the instrument is in perfect adjustment, this line moves in the plane of the meridian.

Besides the above-mentioned fixed wire, there is a movable one, called a micrometer wire, which is moved by means of a screw, remaining always parallel to the fixed horizontal wire.

If the instrument be so adjusted that the image of a star, while passing across the middle vertical wire in the field of view, shall at the same time be bisected by the fixed horizontal wire, the star is at that moment in the line of collimation of the telescope. It is therefore at that moment in the meridian, and its meridian zenith distance is the angle through which the circle would have been turned from the position it had when the line of collimation of the telescope pointed to the zenith. There is a fixed pointer, for the purpose of approximately reading the instrument. If the instrument were accurately adjusted, so that the pointer was opposite the zero point of the circle, when the line of collimation of the telescope pointed to the zenith, the arc intercepted between these two positions of the instrument would be the meridian zenith distance of the star.

Great nicety is required in "reading" the instrument; i.e., in determining exactly the arc through which the circle has moved in bringing the telescope from the vertical to any other position. The rim is usually graduated at intervals of five minutes; and the eye could determine only the division nearest to the fixed index. But by means of a "reading microscope," or micrometer (q.v.), fixed opposite to the rim, the portion of the interval to the nearest division on the rim can be read to seconds. There are usually six such microscopes fixed opposite different points of the rim; and the "reading" of the instrument is the mean of the "readings" of all the microscopes. This tends to eliminate errors arising from imperfect graduation and adjustment. If the instrument is properly adjusted, the zero point of the circle will be opposite the fixed pointer when the line of collimation of the telescope points to the zenith. In practice, however, this is not always accurately, or even approximately the case. As we shall immediately show, it is of no consequence, as the final result of every observation is the *difference* between two readings.

It is evident that the difference between any two readings of the instrument will represent the angle through which the line of collimation of the telescope moves in passing from one position to the other. It remains to show how a fixed point, viz., the nadir (q.v.), is observed, and then how an observation is taken of the star itself in its meridian passage.

We must explain here that the fixed horizontal wire in the eye-piece of the telescope, in the instruments as now used, is only an *imaginary* line which determines the line of collimation of the telescope. It coincides with the position of the micrometer wire, when the screw-head of the micrometer marks zero.

To observe the nadir, a trough of mercury is placed underneath the instrument, and the telescope is turned so as to look vertically downwards into it. An image of the system of cross-wires which is in the common focus of the object-glass and eye-piece, will be reflected back again to nearly the same focus. Looking into the telescope, the observer now adjusts it by means of a tangent screw till the reflected image of the horizontal wire coincides with the real one. The final adjustment is perhaps most delicately affected by turning the screw-head of the micrometer which moves the wire itself. When they coincide, the line joining the center of the object-glass of the telescope with

the intersection between the middle vertical and horizontal micrometric wire, will be vertical. Now, the angle between this and the line of collimation of the telescope, which, as we have said, joins the optical center of the object-glass with the intersection of the middle vertical and imaginary fixed horizontal wire, will, if the micrometer is in proper adjustment, be at once read off the micrometer screw-head. The instrument being clamped as above adjusted, the microscopes are read off, and the reading of the micrometer screw-head above mentioned being added to or subtracted from this reading, as the case may be, the nadir reading of the instrument is determined. The zenith reading, therefore, which differs from it by 180°, is at once known.

Again, to observe a star in the meridian, the instrument is previously adjusted so that the star, in passing the meridian, shall pass over the field of view of the telescope. As the image of the star approaches the center of the field, the observer adjusts the telescope by the tangent screw, so as very nearly to bring the image of the star to the horizontal wire. Finally, just as the star passes the middle vertical wire, he bisects the image of the star with the horizontal wire by a touch of the micrometer screw-head. The circle being now clamped (or made fast), the "reading" is determined as before by reading the pointer and microscopes, and adding or subtracting, as the case may be, the reading of the micrometer. This reading now subtracted from the zenith-reading gives the meridian zenith distance of the star; and this, again, subtracted from 90°, gives its meridian altitude above the horizon.

At the royal observatory of Greenwich, the principal observations are now made by an instrument which combines the mural C. with the transit instrument. See Transit Instrument.

CIRCLE, Quadrature of. See Quadrature.

CIRCLES of the SPHERE. See Armillary Sphere.

CIRCLEVILLE, a city in Pickaway co., Ohio, on the Scioto river, and the Cincinnati and Muskingum Valley railroad, and the Ohio canal; pop. '70, 5,407. It was built on the site of an old Indian fortification of circular form, from which comes the name. The city has many mills and manufactories.

CIRCUIT COURT, in American jurisprudence, a court whose jurisdiction extends over a number of counties or districts, and which holds its sittings in various places within the jurisdiction. More definitely, a class of federal courts of which the terms are held in two or more places successively in the various circuits into which the whole union is divided. They are presided over by the chief-justice of the United States, or one of the associate judges, or by a special circuit justice, or in some cases by a district judge. The C. C. has jurisdiction in law and equity, direct and appellate; hears appeals in admiralty, and in some instances in criminal cases. The systems respecting circuit courts in the several states differ considerably. In the classification of English courts no such title is known.

CIRCUITS (Fr. *circuit;* Lat. *circuitus,* a going round). In England.—England and Wales, with the exception of the co. of Middlesex, are divided, for judicial purposes, into eight C., which the 15 judges visit twice or thrice a year, in pairs, for the purpose of adjudging civil and criminal causes. These C. are the Home, the Midland, the Norfolk, the Oxford, the Northern, the Western, the North Wales, and the South Wales. Criminal charges within the co. of Middlesex and the city of London and surrounding district, are disposed of at sessions which are held monthly at the central criminal court. Before and after term, the judges of the superior courts sit for the adjudication of civil causes in the Guildhall of the city of London, with the exception of the lord chancellor and the vice-chancellor, who sit at Lincoln's inn. "These judges of assize came into use in the room of the ancient justices in eyre, *justiciarii in itinere,* who were regularly established, if not first appointed, by the parliament of Northampton, 1176 A.D., in the twenty-second year of Henry II., with a delegated power from the king's great court, or *aula regia,* being looked upon as members thereof."—Stephen's *Com.*, vol. iii. p. 415. See Assize and Nisi Prius.—Ireland is divided into the North-east, the North-west, the Home, the Leinster, Connaught, and Munster circuits. See Ireland, Scotland, Justiciary Court.

CIRCULAR NOTES are bank-notes specially adapted for the use of travelers in foreign countries; and being, in fact, bills personal to the bearer, they are believed to be more safe as traveling money than ordinary notes or coin. C. N. are furnished by the chief London banking-houses. Those who wish to obtain them, determine beforehand what sum of money they will require on their journey, and that they pay to the banker, who, in exchange, gives C. N. to the amount, each of the value of £10 and upwards. Along with these notes is given a "letter of indication." This letter (a lithographed form in French) is addressed to foreign bankers, requesting them to pay the notes presented by the bearer, whom they name, and to aid him in any way in their power. By way of verification, the bearer appends his signature, and the letter is complete. On the back of the letter there is a long list of foreign bankers, extending all over Europe, any of whom will cash one or more of the C. N., on being presented and indorsed by the bearer; the indorsement being of course compared with the signature on the letter of indication, which is at the same time exhibited. In paying these notes, the money

of the country is given, according to the course of exchange, and free of any charge for commission. For security, the letter and the notes should not be carried together, in case of being stolen or lost. These C. N. are doubtless a safe and convenient species of money, exchangeable in almost every town visited; and if any remain over on coming home, they will be taken back at their value by the banker who issued them. There are, however, certain drawbacks connected with these notes, which every traveler less or more experiences. In many, almost in all, instances, there is a difficulty in finding out where the banker named is to be found; for foreign bankers generally occupy obscure apartments several stories high, and not unusually in dingy out-of-the-way alleys. To discover them, a commissionaire may be necessary, Then, in some instances (in Paris invariably), the banker jealously scrutinizes the bearer, asks to see his passport, and takes a note of the hotel at which he lodges; all which may be proper as a precaution against roguery, but it is not pleasant. Further, the C. N. are ordinarily of a thick stiff kind of paper, which does not well fit into a purse or pocket-book. On these several accounts, the careful class of travelers who keep to the main thoroughfares of France, Germany, and Belgium, will find £5 or £10 bank of England notes, and sovereigns or napoleons, a preferable kind of money to take on their journey. W. C.

CIRCULAR NUMBERS are numbers whose powers end on the same figure as they do themselves: such are numbers ending in 0, 1, 5, 6.

CIRCULAR PARTS, the name given to a rule in spherical trigonometry, invented by lord Napier. It is to be found in any treatise on that subject.

CIRCULATING DECIMALS. See DECIMALS.

CIRCULATING LIBRARY, a collection of books lent out on hire—circulated from hand to hand. The plan of lending books on hire is not new. Chevillier, in his *Origines de l'Imprimerie de Paris* (4to, 1694), mentions that, in 1342, a century before the invention of printing, a law was framed in Paris, to compel stationers to keep books to be lent on hire, for the special benefit of poor students and others. This fact is alluded to as follows, by E. S. Merryweather, in his entertaining work, *Bibliomania in the Middle Ages* (London, 1849): "The reader will be surprised at the idea of a circulating library in the middle ages, but there can be no doubt of the fact, they were established at Paris, Toulouse, Vienna, and other places. These public librarians, too, were obliged to write out regular catalogues of their books, and hang them up in their shops, with the prices affixed, so that the student might know beforehand what he had to pay for reading them." This writer, quoting from Chevillier, gives a list of books so lent out, with the prices for reading them. The books are all of a theological or classical kind. Among them is the Bible, the perusal of which is set down at 10 sous. "This rate of charge," it is added, "was also fixed by the university, and the students borrowing these books were privileged to transcribe them, if they chose; if any of them proved imperfect or faulty, they were denounced by the university, and a fine was imposed upon the bookseller who had lent out the volume." In these arrangements, we see the efforts that were made to procure the use of books before the art of printing had cheapened the cost of literature.

By whom the modern C. L. was projected, there is no record. All that can be given are a few facts on the subject. It is known that Allan Ramsay, author of *The Gentle Shepherd*, who was a bookseller in Edinburgh, established a C. L. in that city about 1725. Fond of dramatic literature, Ramsay appears to have incurred some local obloquy by lending out plays; and his wish to introduce a taste for the drama into Edinburgh may accordingly have suggested the notion of a circulating library. Be this as it may, the library which he began was continued through various hands for above a hundred years. At Ramsay's death in 1758, his library was sold to a Mr. Yair, whose widow carried it on till 1780, when it was bought by Mr. James Sibbald, an ingenious inquirer into Scottish literary antiquities. Sibbald lived some years as a literary man in London, during which period, beginning with 1793, the C. L. was carried on, subject to an agreement by a Mr. Laurie. Sibbald afterwards resumed the direction of the library, which he considerably extended. At his death in 1803, his brother attempted to carry it on; but not being successful in his management, he disposed of it in 1806 to Alexander Mackay, a person of extraordinary energy and perseverance. By the acquisition of various other libraries, Mr. Mackay greatly enlarged the collection, which, under the name of the Edinburgh C. L., he conducted at 154 High street. Here, by long-continued and minute attention to business, Mr. Mackay realized a competency, and he retired from active pursuits in 1831, when this extensive collection of books was broken up and sold by auction.

There are several circulating libraries in London, claiming to be of old date, but probably not so early as 1725. In a late reprint of an old advertisement, we see "Proposals for erecting a public circulating library in London," under date June 12, 1742. This library was to be established "in some convenient place at or near the royal exchange;" and the subscription was to be a guinea per annum. Two of the present circulating libraries are believed to be descended from this primitive stock. So numerous had circulating libraries become in the early years of the present century, that they absorbed whole editions of novels and romances prepared for the purpose by a London

publishing establishment, designated the Minerva press. The issue of cheap books and periodicals about 1832 (see BOOK-TRADE) seriously damaged the C. L. system; for people now bought instead of borrowing materials for light reading. The vast increase to the reading public in recent times, and the continually augmenting number of new and popular works of a respectable class, have been the means of restoring prosperity to circulating libraries, more especially in London, where some of them are on a surprisingly gigantic scale. To one library alone, as many as 100,000 new books are said to be added annually, and of kinds very different from those of the old Minerva press school. The method of reading from these libraries consists in paying a sum per annum—usually a subscription of a guinea—for which a number of new books may at all times be procured, and kept for a specified period. When the books are no longer in demand, they are sold at reduced prices.

The method of circulating books among the members of private associations, is noticed under the head BOOK-CLUB; and that of circulating books in rural districts by means of libraries which are shifted from place to place, will be found in the article ITINERATING LIBRARIES. W. C.

CIRCULATING MEDIUM. See MONEY, *ante*.

SUPPLEMENT TO VOLUME III.

*An * indicates that the article to which it is prefixed is continued from the main work.*

*BREACH. B. of arrestment is not a recognized term in the U. S. The removal of attached property is a contempt of court and will be punished as such. The rules of the common law have generally been retained in regard to B. of Close. The old name for this was "*trespass quare clausum fregit.*" An instance not mentioned *ante*, in which such a B. is justifiable is for the immediate abatement and removal of a nuisance upon adjoining lands. If, after due notice to the owner of the lands upon which the nuisance exists, he refuses or neglects to remove or remedy the same, any person who is injured thereby may go upon the land and abate the nuisance without being considered guilty of B. of Close. As a matter of public policy, also, it is permitted for travelers to go upon lands adjoining the public roads when by reason of some obstruction the roads are impassable. In such case, care should be taken to do as little damage as possible and the right ceases as soon as the road is fit for travel. The same general rules as to B. of Covenant and B. of Contract prevail in the U. S. as in England. Relief by specific performance can only be obtained in courts of equity or from courts having equity powers; in many states these powers are united with the functions of the old common law courts.

*BREAD. The statutes of most of the U. S. in reference to food and adulterations thereof generally provide for punishment for the sale of adulterated and unwholesome articles, but are much more general than the English statute. There are no specific enumerations of the requisite ingredients of bread. There is usually appointed a public inspector and analyst, and goods suspected of adulteration must be submitted to his tests. If adulteration is found, the articles may be seized and a fine imposed. Wisconsin approaches more nearly to the English law in this respect than any other state.

BREESE, SYDNEY: 1800–78; b. N. Y.: removed to Ill., 1821. He held important legal offices in Ill., and published a vol. of Supreme court reports, 1829. He served as lieut. col. of vols. in the Black Hawk war; was elected to the Supreme court, 1841; U. S. senator, 1843–49. He was one of the originators of the Ill. Central railroad. After years of service as speaker of the Ill. house of representatives, and in the circuit judgeship, he was elected justice of the Supreme court, holding the office till his death—being for several terms chief justice.

BRETON, ÉMILE: b. France, 1831; bro. of Jules. He became an artist in 1857, after trying the army and business life. During the Franco-German war, he re-entered the army, commanding a battalion, and was decorated for bravery at the battle of St. Quentin. Among his landscapes are "Canal of Courrières," and "Sunset in Autumn."

BREWER, LEIGH RICHMOND, D.D.: b. 1839: graduated at Hobart coll., 1863; Gen. theol. sem., 1866; ordained priest, 1867; consecrated miss. bishop Prot. Epis. diocese of Montana, 1880.

BREWSTER, BENJAMIN HARRIS: b. Salem, co., N. J., 1816: graduated at Princeton college, 1834; admitted to the bar of Philadelphia, 1838; and soon rose to the head of his profession. He was appointed atty. gen. of Penn., 1867, and atty. gen. of the U. S. under Pres. Arthur, Dec. 16, 1881.

BRIC-A-BRAC: a word formed from the French proverbial expression *de bric et de broc*, (which finds a near equivalent in the English "by hook or by crook,") and used to denote a miscellaneous collection of articles of vertù, such as bibelots, curios, odds and ends of pottery, and knicknacks of every description. The rage for collections of this kind sprang up in Europe about twenty years ago. At first it was sporadic, attacking only a few people of wealth and leisure, but it soon developed into an epidemic, crossed the Atlantic about the time of the centennial exhibition in Philadelphia, and covered our shelves and mantelpieces with costly, elegant, grotesque, or ingenious baubles, and our walls with Japanese fans and porcelain dishes of uncouth proportions. Associating itself with the cotemporary craze for decorative

art it found fanatical disciples whose published utterances seemed to imply that the souls to whom Christianity was an obsolete superstition might be regenerated by the saving influences of blue china. The bric-à-brac hunter rivalled the bibliomaniac in the extravagant prices that he paid for bibelots and curios merely on account of their antiquity or rarity, and without regard to their design, form, color, or beauty. But the first extravagances of the new fashion have almost subsided, and they have left behind in many quarters a genuine love for and appreciation of artistic ceramics, which speaks well for the art future of our country.

BRIDGEWATER: a tp. in Somerset co., New Jersey; incls. Somerville village, Raritan, and Bound Brook. Pop. '80, 7,997.

BRIDGMAN, Charles De Witt, D.D.: b. Saugerties, N. Y., 1835: graduated at Roch. theol. sem., 1857; was pastor Bapt. church, Morristown, N. J., 1857–60; Bapt. church, Jamaica Plains, Mass., 1860–62; Pearl St. Bapt. church, Albany, N. Y., 1862–78; from 1878, pastor of Madison Ave. Bapt. church, New York. He edited *Songs for the Lord's House*, 1882. Dr. B. is master of an attractive pulpit style, conveying rich and vigorous thought.

BRIDGMAN, Frederick A.: b. Alabama, 1847: figure painter. He was by profession an engraver, but exhibited some paintings in New York before 1866, and in that year went to Paris. He studied under Gérome, receiving, 1877, a third-class medal for his "Funeral of a Mummy," exhibited in the *Salon*. "In the Harem" is another of his numerous works, nearly all of which represent Oriental scenes.

*BRIGADE: in the U. S. army, a body of troops consisting of two or more regiments, either cavalry, artillery, or infantry, under the command of a brigadier-general. Unlike the English brigade it is not a temporary grouping liable to be broken up at any time by the commander of the army. Two or more brigades form a division, and two or more divisions an army corps.

*BRIGADIER-GENERAL: in the U. S. army, an officer in command of a brigade. He is one degree higher than a col., and one degree lower than a maj. gen. He is sometimes called simply brigadier.

BRIGGS, Charles Augustus, D.D.: b. 1841: graduated at Union theol. sem., New York, 1863; studied at Univ. of Berlin, Prussia, 1866–69; ordained (Presb.) 1870; pastor at Roselle, N. J., 1870–74; since 1874 prof. of Hebrew and cognate languages in Union theol. sem. Beside contributions to periodicals, Dr. B. pub. (1883) *Biblical Study*, a work of recognized importance in biblical criticism.

BRIGHT, John Morgan, L.L.D.: b. 1817: graduated at Nashville univ., 1839; at the law depart., Transylvania univ., 1841; settled as a lawyer in Fayetteville, Tenn. He was a member of the Tenn. legislature, 1847–8; was elected as a dem. to XLIId and four succeeding congresses.

BRIGNOLI, Pasquale: 1820–84: b. Italy. After singing with much success in many of the principal opera houses in Europe he came to this country, in 1855, and for a quarter of a century was one of the most popular of operatic tenors. He acted in support of Mme. Patti when she first appeared here, and filled the same position with nearly every great singer who visited the U. S.

BRISBANE, William H., M.D.: 1803–78: b. S. Car., d. Wis.: came north in 1835 to support the abolitionists, of whose cause he became a prominent advocate.

BRISCOE: a co. in the "Panhandle" of Texas; formed 1876: drained by headwaters of Red River: 900 sq. m. Pop., '80, 12; unorganized and attached to Wheeler co. for judicial purposes.

BRISSON, Henri: b. Bourges, France, 1835: studied law at Paris, where he started a republican journal called *L'Avenir*. He was returned, 1871, to the national assembly; and is a leader of the extreme "left." He was elected pres. of the chamber of deputies, 1882; and upon the downfall of the Ferry ministry, 1885, consequent on the military disaster in Tonquin, formed a new cabinet, with himself as premier. M. B. is an infrequent but powerful speaker.

BRISTOL, John Bunyan: b. N. Y., 1826: landscape painter, member nat. acad.; resident of New York. Among his works are "Ascutney Mountain, Vt.," and "The Adirondacks from Lake Champlain."

BRITON-RIVIERE: b. London, 1840: educated by his father William (painter, 1806–76): graduated from Cheltenham coll., Oxford; studied in London with painters of the Scotch school; visited Italy, 1875. His animal figures are natural, expressive, often humorous.

BROADHEAD, James O.: b. Va., 1819: educated at Univ. of Va.; elected to the Missouri legislature, 1847, and to the senate, 1850; U. S. district atty. for e. dist. Mo., 1861; and was elected to the XLVIIIth Congress as a democrat, 1883.

BROADHURST, Henry: b. Littlemore, near Oxford, England, 1840. The son of a journeyman stonemason, he was fourteen years old when he began to follow his father's trade. After a wandering life he settled down in London, 1866, became

prominently identified with the Trades' union, was made sec. of the Trades' congress, and in 1878 was elected a member of parliament by the workingmen of Stoke-upon-Trent.

BROCK, THOMAS: b. Worcester, Eng. 1847: sculptor. He became a pupil and afterwards an assistant of J. H. Foley, after whose death he completed many works that Foley had left unfinished, among others the O'Connell monument in Dublin. He has executed groups, ideal works, and portrait statues. The bust of Longfellow in Westminster abbey is from his hand.

BROGDEN, CURTIS H.: b. N. Car.: was elected to State legislature, 1838, and served for nearly 20 years; was for ten years controller of state; collector of internal revenue; lieut. gov., 1872; and on the death of gov. Caldwell, in 1874, was made governor.

BROMLEY FAMILY: a well-known English artistic family, embracing the following members: WILLIAM, an associate R. A. and an engraver of note in the beginning of this century; WILLIAM, his son, a mezzotint engraver; d. 1839; WILLIAM, son of the above, engraver, landscape and *genre* artist; among his works are "Down the Glen," "Will He Pass this Way," and "Come Along!"; VALENTINE W., 1848–1877, son of the above; made an associate of the institute of painters before coming of age; also associate of the soc. of British artists; on the staff of the London *Illustrated News;* received a gold medal at the crystal palace exhibition of 1877. In his water-colors, among others, are the "White Rose," "The Nearest Way to Church"; his best known oil painting perhaps is "The Fairy Ring."

BROOKE, STOPFORD AUGUSTUS: b. Dublin, 1832: graduated at Trinity coll., 1856; took orders in the Anglican church, and after holding various curacies in London and its vicinity was made chaplain in ordinary to the Queen, 1872. He seceded from the Anglican communion, 1880, affirming his disbelief in the accepted doctrine of miracles. His best known works are *Life of Frederick W. Robertson*, 1865; *Theology in the English Poets*, 1874; *A Primer of English Literature*, 1875; and *Sermons*, 4 vol., 1868–77. Though his utterances suggest rationalism, his spirit is evangelical.

BROOK FARM ASSOCIATION OF EDUCATION AND AGRICULTURE: a socialistic community, founded, 1841, at West Roxbury, Mass., which adopted the views of Fourier in a modified form and attempted to carry them out in action. The organizer and guiding force of the association was George Ripley. He gathered around him many persons who were then or afterwards became famous in literature. Chief among these were Hawthorne, Alcott, George W. Curtis, W. H. Channing, and Margaret Fuller. The aim of this assoc. as explained by Ripley was "more effectually to promote the great purposes of human culture, to establish the external relations of life on a basis of wisdom and purity" and, especially, "to substitute a system of brotherly cöoperation for one of selfish competition." Is was open to all sects and welcomed all kinds of degrees and mental culture. All members, without distinction of sex, had to labor an allotted period each day for the common good, either on the farm or in the workshops attached to the main institutions. In pursuance of the attempt toward a more just recompense for labor all employments were paid substantially alike. All shared the same food at the same table, all owned a like portion of the property belonging to the establishment, all had equal access to its educational and literary advantages. The society trafficked with the outside world, selling its surplus produce, and educating children at a low rate of compensation. But it was soon found that enough could not be earned for the needs of the establishment. Moreover many of its brightest ornaments grew weary and left it. The remainder were disheartened. On March 3, 1846, a fire destroyed one of the most important and costly buildings. The association never recovered from this blow. It lingered on for a while and finally dissolved, Oct. 1847. Much of the celebrity attached to this organization is due to Hawthorne's *Blithedale Romance* in which under the guise of fiction he has evidently utilized many of his experiences at Brook Farm.

BROOKLAND: a magisterial dist. of Henrico co., Va. Pop. '80, 4,117.

BROOKLYN: a tp. of Alameda co., Cal., s. e. of Oakland city, and including the 7th ward of that city; sometimes known as East Oakland. San Francisco bay lies w. of Brooklyn, which is on the Central Pacific railroad, San José branch; in the tp. are 5 churches, 2 tanneries, 2 terra cotta works, 2 carriage factories, and a newspaper office; and there is connection with Oakland proper by a bridge over a small inlet from the bay. Pop. '80, 7,484.

BROOKVILLE: a magisterial dist. of Campbell co., Va., containing Lynchburg city (q. v). Pop. of dist. '80, 20,318.

BROPHEY, GEORGE: b. Ireland, 1775; d. Iowa, 1880. He was educated for the Rom. Cath. priesthood, at Carlow college, and in Paris; assisted at the funeral of Napoleon I.; and attended the death-bed of Lafayette. He came to America, 1843, and was pastor of St. Paul's, New York, removing to Iowa, 1856.

BROWN : a co. in Dakota ; formed 1879. Pop. '80, 353.

BROWN, FORD-MADOX : b. Calais, France, of English parents, 1821. He studied art on the continent, and in 1844 sent two cartoons to Westminster Hall which won the admiration of Haydon and of Dante Rossetti. A warm friendship resulted between Rossetti and himself, and when the former founded the Pre-Raphaelite Brotherhood, B., though he held himself aloof from actual membership in the society, was generally looked upon as one of its master spirits. Among his best known pictures are "Wicliff reading his Translation of the Scriptures," 1848 ; "King Lear," 1849 ; Chaucer at the Court of Edward III., 1851 ; "Christ Washing Peter's Feet," 1852 ; etc.

BROWN, HENRY ARMITT : 1844–78 ; b. Philadelphia : graduated at Yale coll. ; was admitted to the bar, but distinguished himself chiefly as a political orator. He earnestly advocated the cause of municipal reform in Philadelphia, made numerous speeches throughout the country in favor of Rutherford B. Hayes during the presidential campaign of 1876, and delivered brilliant addresses on anniversary and festival occasions, etc. A posthumous collection of his speeches, with a memoir, appeared in 1880.

BROWN, J. APPLETON : b. Mass., 1844 : landscape painter ; resident of Boston. He studied mainly under Lambinet of Paris. Among his works are "Old Road near Paris," and "On the Merrimack near Newburyport."

BROWN, JAMES BALDWIN, D.D. : 1820–84 ; b. England : for many years pastor of the Independent church at Brixton, London ; was elected chairman of the Congregational Union of England and Wales, 1878. He was widely known and honored as a preacher, scholar, and author. His books have found many admiring readers in the U. S.

BROWN, JOHN HENRY HOBART, S.T.D. : b. New York, 1831 : graduated at the Gen. theol. sem. 1854 ; ordained priest in the Prot. Epis. church, 1855 ; and after holding rectorships in various cities in N. Y., was consecrated bishop of the newly organized diocese of Fond du Lac, Wis., 1875. He has published a few sermons, pamphlets, and addresses.

BROWN, JOHN YOUNG : b. Ky. 1835 : graduated at Centre coll., Danville, Ky., 1855 ; admitted to the bar, 1857. He was elected to the XXXVIth congress, but not having attained the age required by the constitution of the U. S., was not allowed to take his seat until the second session. He was elected to the XLth, XLIIIrd, and XLIVth congresses.

BROWN, JOSEPH E. : b. S. Car., 1821 : graduated at Yale law school ; began practice, 1846 ; elected to the state senate, 1849 ; elected gov. of Ga. by the democrats, 1857 ; re-elected, 1859 ; and again elected, 1861, over two opposing candidates. He was active as a war governor during the rebellion, opposing Pres. Davis on the conscript act. After the war B. became a prominent reconstructionist, voting for Gen. Grant, against the wishes of the majority of his party. He suffered the only political defeat of his life in 1868, when, as the republican candidate for U. S. senator, he was beaten by Joshua Hill, dem. He was appointed chief justice of the Supreme court of Ga., and has since been a reconstructionist democrat. He was elected to the U. S. senate, 1879.

BROWNE, HABLOT KNIGHT : 1815–82 : an English caricaturist and book illustrator, well known under his pseudonym of "Phiz." He first came into prominence in 1835, when he succeeded Seymour as the illustrator of the *Pickwick Papers* ; subsequently he illustrated a number of the novels of Dickens, Lever, Mayhew, and Ainsworth, besides contributing to comic serials, etc.

BROWNE, THOMAS M. : b. Ohio, 1829 : studied law in Ind., and was elected prosecuting atty. for the 13th judicial circuit of that state, 1855 ; and was chosen to the state senate. In the civil war he was breveted brig. gen. by Pres. Lincoln. He was U. S. atty. for the district of Ind., 1872 ; and, in the same year, was defeated by Thos. A. Hendricks, in the contest for the governorship. He was elected as a republican to the XLVth and the three succeeding congresses.

BROWNING, ORVILLE H. : 1806–81 : b. Harrison co., Ky. : was admitted to the bar and removed to Quincy, Ill., 1831 ; served through the Black Hawk war, and was elected to the state senate, 1836, and to the legislature, 1840. At the Bloomingdale convention he co-operated with Abraham Lincoln in organizing the republican party in Ill. In 1861 he was appointed to fill the vacancy caused by the death of Stephen A. Douglas, U. S. senator from Ill., and in 1865 accepted the position of secretary of the Interior under Pres. Johnson.

BROWN'S TRACT : a tract of land, containing 210,000 acres in the Adirondack mountain region in n. N. Y., extending across Herkimer co., and into Hamilton on the e. and Lewis on the w. It was purchased by John Brown, the patron of Brown univ., R. I., from Alexander McComb, who had bought from the state abt. 4,000,000 acres at 8d. per acre, with the result of financial ruin to himself. The tract, which

is magnificently wooded, is now in the possession of lumber merchants, who are felling the timber upon it, and is a part of the land which the state is urged to acquire for the proposed Adirondack reservation.

BRUCE, BLANCH K. : b. Va. : his parents being slaves, his education was limited. After the late war he became a planter in Miss., 1869 ; held several local offices ; was elected U. S. senator from Miss., as a republican, 1875, holding this office till 1881. In his official station he has shown excellent character and capacity.

BRUCH, MAX : b. Cologne, 1838 : at an early age showed remarkable talents for musical composition ; held the Mozart scholarship, 1853–57 ; and in 1863 brought out the opera of *Lorelei*. His chorus-work *Frithjof* was his first great success ; this was followed by many similar compositions, *Odysseus*, *Arminius*, *The Song of the Bell*, *Salamis*, and *Normannez*, all of which have been very popular. After holding positions as musical director in several German cities, he was nominated, 1880, to succeed Sir Julius Benedict as director of the Philharmonic society, Liverpool, Eng.

*BRUGSCH, HENRY CHARLES, (BRUGSCH BEY, BRUGSCH PASHA) : in 1869 was invited by the Viceroy of Egypt to take charge of the school of Egyptology in Cairo ; received the titles of Bey and of Pasha ; and in 1881 succeeded M. Mariette as keeper of the Egyptian collections at Boulak, but later in the same year returned to Berlin to deliver a course of lectures on Egyptology. His principal works are *Egyptian Monuments*, 1862–6 ; *History of Egypt from the Earliest Times to the Present Day*, vol. I., 1859 ; *A Dictionary of Hieroglyphics*, 1867–8 ; *The Exodus and the Egyptian Monuments*, 1875 ; etc.

BRULÉ : a co. in Dakota ; formed 1875. Pop. '80, 237. Co. seat, Brulé City.

BRYCE, JAMES : b. Glasgow, 1838 : educated at Glasgow university and at Trinity coll., Oxford. He was called to the bar, has held the positions of Regius prof. of civil law, Oxford, and prof. of civil law to the council of legal education. He became a member of the house of commons, 1880. He is the author of *The Holy Roman Empire*, and *Travels in Transcaucasia*.

BRYENNIOS, PHILOTHEOS : b. of Greek parents near Constantinople, 1833 : educated in the Patriarchal seminary at Chalce, and attended courses at the universities of Berlin, Leipsic, and Munich, where he became familiar with German theology. He has consorted with western theologians more frequently than is customary for Greek ecclesiastics, and attended the Bonn conference of Old Catholics, 1875. B. was prof. of church history at Chalce ; was metropolitan of Serra ; and afterward metropolitan of Nicomedia, in ancient Mesopotamia. He was the discoverer of two *Epistles of Clement*, and of *The Teaching of the Twelve Apostles*, the publication of the latter, in 1884, being one of the chief theological events of the last decade. Both manuscripts were found in the monastery of the Holy Sepulchre, Constantinople. See TEACHING OF THE TWELVE APOSTLES.

BUCHANAN : a magisterial dist. in Botetourt co., Va. ; on the James river canal, 38 m. n. w. of Lynchburg ; connected with Pattonsburg by a bridge ; contains several stores, mills, and 4 churches. Pop. '80, 4,808.

BUCHANAN, ROBERT C. : b. Md., d. 1878 : graduate of West Point, 1830 ; served meritoriously in the Black Hawk, Seminole, and Mexican wars ; was made brevet lieut. col. after the battle of Molino del Rey ; was lieut. col., Fourth Infantry, in the army of the Potomac during the peninsular campaign ; brevet col., June, 1862 ; brig. gen., volunteers, Nov. 1862 ; col., First Infantry, Feb. 1864, commanding at New Orleans, Dec. 1864–Aug. 1865 ; brevet brig. gen. U. S. A., Mch., 1865 ; brevet maj. gen., the same year, and retired from service.

BUCHHOLTZ, REINHOLD : 1836–76 ; b. Germany. He was educated in the gymnasium of Königsberg, the Joachimsthal gymnasium of Berlin, and the medical departments of Greifswalde and Berlin universities. After practising a short time at Greifswalde, he gave up medicine for zoology, and spent some time in Italy, studying marine life. He accompanied the North-Pole expedition of the Hansa, and wrote several articles on this subject. He was soon after made prof. in Greifswalde univ. He made an unsuccessful attempt, 1872, to explore the mouths of the Niger. In recognition of his services to science he was made, 1876, prof. ordinary at Greifswalde.

BUCK, DUDLEY : b. Hartford, Conn., 1839. A commercial career was chosen for him, but he early showed such aptitude for music that his father allowed him to leave college, 1858, in order to prosecute his musical studies at the Leipsic conservatory. Returning to the U. S., 1862, he soon became noted as a musical leader, composer, and organist. He furnished the music for Lanier's cantata, sung at the opening of the Centennial exhibition, Philadelphia, 1876, and gained the prize of $1000, offered by the Cincinnati Musical festival of 1880 for the best cantata, choosing Longfellow's *Golden Legend* as his text.

BUCK, GURDON, M.D. : 1807–77 : studied medicine under Dr. Thomas Cook, and graduated from the college of Physicians and Surgeons, New York, 1830. He was

celebrated as the originator of "Buck's Extension," for the treatment of fractures; was visiting surgeon to many of the New York hospitals; and closely connected with the medical societies of the metropolis. He published *Contributions to Reparative Surgery*, and contributed largely to medical journals.

BUCKLEY, James Monroe, d.d.: b. 1836, Rahway, N. J.: was educated at Pennington sem., and entered Wesleyan univ., but left college during the freshman year; studied theology in Exeter, N. H. In 1859 he joined the N. H. conf. of the M. E. church. He was stationed at Dover, Manchester, and Concord, 1859–63; Detroit, 1864–5; New York, 1866; Brooklyn, 1867–80. In 1872, 76, 80, Dr. B. was delegate to gen. conf.; in 1881, delegate to ecumenical Meth. conf., London. Since 1880 he has been the editor of the *Christian Advocate*. He edited *Hymn Book of M. E. Church*, 1876; was author of *Christians and the Theater*, 1876; and of other works. He was active as member of the committee on judicial code for discipline, 1880. He is not surpassed in his denomination for keenness of argument and apt and ready expression in extemporaneous debate.

BUCKNER, Aylett Hawes: b. Va., 1817: educated at Georgetown coll., and the univ. of Va.; taught school and studied law; removed to Mo., 1837, and held several important legal positions in St. Louis. He was elected as a democrat to the XLIIIrd and the five succeeding congresses.

BUFFALO: a co. in w. Kansas; formed in 1873: 576 sq. m.; drained by Pawnee River. Pop. '80, 191.

*BUILDING LEASES. While there is nothing in the law of the U. S. to prevent building leases, their use is very infrequent. Lands are frequently leased for purposes of building, and even for as long terms as 99 years, but there is almost invariably a clause in the lease providing that when the term shall have expired it may be renewed by the lessee or his assigns at their option. In such case it is usually provided that the amount of the rent to be paid for the new term shall be a certain per cent. of the value of the property. If the lessee or lessor do not wish to renew the lease then one or the other shall sell, the landlord having his option. The values in such case to be ascertained by three disinterested real estate owners of the vicinity. These provisions, of course, vary in different communities, and may in any instance be whatever may be agreed upon by the parties.

BULGARIS, Dimitri: 1801–78; b. in the island of Hydra, Greece, of which his father was gov. He entered public life, 1833, as a senator; was minister of finance, 1848–9, and prime minister and minister of the interior during the Crimean war; but resigned, 1857, and led a determined opposition against the Bavarian dynasty. On the dethronement of King Otho he became regent, and for a brief period had almost unlimited power, but was forced to resign by an insurrection in the army.

BULLOCK, Alexander Hamilton, ll.d.: 1816–82; b. Royalston, Mass.: fitted for college at Leicester acad.; graduated at Amherst college, 1836; teacher at Princeton, N. J., 1836–39; studied law with Emory Washburn and at Harvard law school, 1839–41; was admitted to the bar, 1841; practised in Worcester, 1842–82. He was a member of the Mass. house of representatives, 1845–47 and 1861–65; speaker, 1862–66; member of Mass. senate, 1849; commissioner of insolvency, 1853–56; judge of court of insolv., 1856–58; mayor of Worcester, 1859; gov. of Mass., 1866–68; trustee of Amherst coll., 1852–82. He published a number of addresses political and literary. He received from Amherst, 1865, and from Harvard, 1866, the degree of LL.D.

BULOZ, François: 1803–77; b. Vulbens, near Geneva, Switz.: settled in Paris and became first a proof-reader and then a translator. In 1831 he founded the *Revue des Deux Mondes*, a bi-monthly, which he edited with such conspicuous ability as to make it the representative literary journal of France. The *Revue* is now edited by his son Charles.

BUNCE, William Gedney: b. Conn., 1840: artist; studied drawing under Julius Busch, and oil-painting under William Hart; is noted as a colorist, and as an artist of bold and rich style. He resides in New York. His pictures mainly represent Venetian canals and shipping.

BUNNER, Henry C.: b. abt. 1855: a well-known contributor to the magazines; the editor of the humorous weekly, *Puck*. His style is light and graceful, and he is particularly happy in the production of short stories and *vers de société*. He has published *Airs from Arcady and Elsewhere*, a work called *The Woman of Honor*, and with Brander Matthews, a volume of stories entitled *In Partnership*.

BUNSEN, Frances, Baroness: 1791–1876: wife of Christian Karl Josias, of whom she published a biography, London, 1868, under the title *A Memoir of Baron Bunsen, Drawn Chiefly from Family Papers by his Widow, Frances, Baroness Bunsen*. She was an Englishwoman by birth and was distinguished for her unaffected piety and kindness of heart. See *Life and Letters*, by J. A. C. Hare.

BURCHARD, Samuel D., d.d.: b. Ky., 1811: was educated in that state, where also was his first labor as a minister. During the yellow fever epidemic in the

South he remained faithfully at his post while others fled. In 1839, he became pastor of the Houston street Pres. church, New York; in 1879, he was made pastor of the Murray Hill church; but, 1885, he withdrew from active service, and became pastor emeritus. Dr. B. became widely known during the Blaine-Cleveland campaign by his alliteration, "Rum, Romanism, and Rebellion," with which he charged the Democratic party at a Republican meeting over which he had unexpectedly been called to preside a few days before the election. The sentiment of this alliteration was attributed to Mr. Blaine on leaflets which his opponents immediately scattered by myriads among the Irish voters who had been favorable to him. Dr. B. who has for years been pres. of Rutgers Female seminary, New York, is warmly esteemed by those who know him intimately.

*BURDEN OF PROOF. In addition to what has been said (*ante*), it may be noticed that the obligation of the party upon whom the B. of P. rests is different in civil and criminal actions. In civil suits the obligation of the B. of P. is overcome if the proof is such that the probability of the assertion is proven; or more exactly, it will be sufficient if the preponderance of testimony, all things considered, is in support of the view sought to be established. In criminal cases, on the other hand, the jury in order to convict, must find that the evidence establishes guilt beyond a reasonable doubt.

BURDETTE, Robert Jones: b. Greensboro, Penn., 1844: educated at the High school, Peoria, Ill.; served as a private soldier during the war; in 1868, became night editor of the *Peoria Daily Transcript*. In 1873 he joined the staff of the Burlington, Iowa, *Hawkeye*, and soon made that paper famous by his humorous paragraphs. He has published *The Rise and Fall of the Moustache*, *Hawkeyes*, and a burlesque *Life of William Penn*.

BURGERS, Thomas François: 1834–81; b. Cape Colony: Ex-pres. of the Transvaal republic. He was educated at the univ. of Utrecht in Holland; made pastor of the Dutch Reformed church of Hanover, Cape Colony; and on a trial for heresy was acquitted. B. was elected pres. of the Transvaal republic by the Liberals, succeeding Mr. Pretorius; and continuing in office until the annexation of the republic by the British, 1877. In theology B. held rationalistic views; while his presidential policy was remarkable for brilliant but impracticable schemes.

BURGESS. Alexander, D.D.: b. Providence, R. I., 1819: graduated at Brown univ., 1838, and at gen. theol. sem., 1841: ordained priest, in Prot. Epis. church, 1843; rector of St. Stephen's church, East Haddam, Ct.; St. Mark's church, Augusta, Me.; St. Luke's church, Portland, Me.; St. John's church, Brooklyn, L. I.; Christ church, Springfield, Mass. He was pres. of the house of deputies, in the general convention of 1877: and was consecrated bp. of Quincy, 1878. Dr. B. is brother of the late Bp. George Burgess, of Maine.

*BURGLARY. The general tenor of the law of the U. S. in regard to B. is the same as in Eng. A few differences in details are: B, may be committed in a store over which the owner resides: in a railroad depot, (Vt.); in a stable (Ill). An actual breaking takes place when the burglar breaks or removes any part of the house or its fastenings, with violence. Instances are—cutting and tearing down a netting of twine nailed over an open window, raising a latch when the door is otherwise unfastened, picking a lock, lowering a window fastened only by a wedge or weight, etc. Constructive breaking occurs when entrance is obtained by fraud. The least *entry*, with the whole or any part of the body, hand or foot, will be sufficient to constitute the offence. In many states, as in N. Y., there are degrees of B., and a person may be guilty of B. in the second or third degree when some of the requisites of B. as at common law are wanting.

BURKE, Thomas N., known as "Father Tom": 1830–83; b. Galway, Ireland: studied theology in Rome and Perugia; joined the order of St. Dominic; and after remaining five years in Italy was sent by his superiors to England. He soon established a reputation as an orator; preached in Ireland, England, and Italy; and, in 1872, visited the U. S. where his course of lectures in answer to Froude excited much attention. These lectures were reprinted under the title of *English Misrule in Ireland*, 1873.

BURLEIGH: a co. in w. Dakota; formed 1873; drained on w. by Missouri river, crossed by N. Pacific railroad. Pop., '80, 3,246.

BURLEIGH, Charles C.: 1810–78; b. Mass.: abolitionist, advocate of woman's rights, and anti-Sabbatarian. B. was assist. ed. of the *Unionist*, the anti-slavery organ; and "resident speaker" of the Free congregational society in Florence, Mass. He wrote largely for the press, and was the author of *Thoughts on the Death Penalty*.

BURNABY, Fredrick, Lieut. col.: 1842–85: b. Bedford, Eng.: educated at Harrow and in Germany. Early in life he displayed his fondness for hardships and adventure. He entered the royal horse guards in 1859; travelled extensively; and in 1875, undertook his famous ride to Khiva. In this exploit, unaided and alone, he made

his way to the heart of Asia, notwithstanding the oriental laws forbidding the passage of foreigners into certain districts, and the traps laid by the Russians to waylay him. In 1876–7, he rode on horseback through Asia Minor, and from Scutari to Khiva, in Persia. He was military correspondent of the *Times*, with Don Carlos in Spain; and in 1880, contested Birmingham for parliament as a conservative, receiving 15,716 votes, although Joseph Chamberlain and John Bright were the opposing candidates. He took part in the Egyptian campaigns, and was killed in an engagement with El Mahdi's troops, Jan., 1885. His death was widely lamented in England. An interesting account of B.'s travels is in his two books, *A Ride to Khiva*, and *On Horseback through Asia Minor*.

BURNAND, Francis Cowley: b. 1837: educated at Eton and Cambridge, and called to the bar in 1862. His success as a writer of burlesques led him to adopt literature as a profession. He has produced nearly a hundred dramatic pieces, among which *Ixion*, and the travesty of Jerrold's *Blackeyed Susan*, had remarkable runs. He became one of the leading contributors to *Punch*, and in 1880 succeeded Tom Taylor as its editor. From the pages of that periodical he has collected a number of volumes among which the best known are *Happy Thoughts* (1870), *More Happy Thoughts* (1871), *Happy Thought Hall* (1872), and various travesties of popular novelists.

BURNE-JONES, Edward: an English artist: was educated at Oxford, and intended for the church. Entirely self-taught in art, he allied himself with the romantic school revived by Rosetti. Among his important works are "Chant d'Amour," "Cupid and Psyche," "Circe," "Spring," "The Days of Creation," "Laus Veneris," "Perseus and the Graiæ." His "Beguiling of Merlin," in oils, and "Love as Wisdom," and "Love Among the Roses," in water colors, were in the Paris exposition of 1878; his "Dark Tower" was on exhibition in New York, 1874. He is classed among the pre-Raphaelites, and is said to occupy among artists a position correspondent to that of Keats among poets.

BURNETT, Frances Eliza Hodgson: b. Manchester, Eng., 1849, Nov. 24. When she was fifteen years old her parents emigrated to the U. S., and settled in Knoxville, Tenn. At an early age she began her contributions to periodicals, but the short story of *Surly Tim's Troubles* which appeared in *Scribner's Magazine*, 1872, was the first work from her pen giving evidence of her remarkable abilities. The good impression made by this and succeeding stories and sketches was increased by the powerful novel, *That Lass of Lowrie's*, which after running as a serial through *Scribner's Magazine* was published in book form, 1876. The story was dramatized both in America and in England. She has since published, *Haworth's*, 1878; *Louisiana*, 1880; *A Fair Barbarian*, 1881; and *Through One Administration*, 1882; and in conjunction with W. H. Gillette produced a play *Esmeralda*, 1881, founded on one of her short stories. In 1873 she married Dr. S. M. Burnett and became a resident in Washington, D. C.

BURNSIDE, John: b. Ireland; d. Va., 1881. B. was at the time of his death one of the wealthiest men in the southern states, and the largest sugar-planter in the country. Born in poverty, he was, first, clerk, then partner in a dry goods house in New Orleans, in which business he laid the foundations of his wealth. He owned over 2,000 slaves, and was in possession of ten of the best plantations in La. His employment of free labor was at the time an experiment, and proved abundantly satisfactory.

BURROUGHS, John: b. Roxbury, N. Y., 1837: began as schoolteacher in his native village; married before he was twenty-one years of age, and went to New York where he soon drifted into journalism. He received an appointment in the treasury department at Washington, 1863, and since 1873 has been an examiner of the national banks. His contributions to periodical literature have made him widely known as an enthusiastic lover of nature, especially in her uncultivated aspects, and a refined and appreciative critic. Many of his essays have been collected into book-form under the following titles, *Wake Robin*, 1870; *Winter Sunshine*, 1873; *Birds and Poets*, 1875; *Locusts and Wild Honey*, 1878; *Pepacton*, 1881; *Fresh Fields*, 1884, etc.

BUSCH, Julius Hermann Moritz: b. Dresden, 1821: studied theology and philosophy at Leipsic, but began literary life as a translator of Dickens, Thackeray, and other English authors. In 1851 he visited the U. S.; in 1852 he published *Wanderings between the Hudson and the Mississippi*. Subsequently he became known as a political writer, and in 1870 received an appointment in the foreign office at Berlin, which brought him into close relationship with Bismarck, whose views he ardently embraced. A part of his diary kept during the French campaign, was with Bismarck's permission published in 1878 under the title of *Count Bismarck and his People* and made a great stir in Europe and the U. S.

BUSS, Frances Mary: b. London, 1827. She began the work of a teacher on completing her own studies and together with her mother, established, 1850, the

Camden school for girls, and in 1870 the North London collegiate school for girls. She is headmistress of this institution and honorary superintendent of the Camden school, and a vice-president of the college of Preceptors. A large proportion of her pupils, who have passed the Cambridge local examination, have taken honors; a scholarship offered by Girton college has been won by them three years in succession, and in the examinations for women held by the univ. of London they have stood very high.

BUSS, Franz Joseph von: 1803–78: a German jurist and Roman Catholic controversialist. He studied at several of the universities, and was made doctor in law, medicine, and philosophy. B. was at first associated with the Liberal party, but soon became one of the most prominent Rom. Cath. leaders in Germany. The following are among his most important works: *Ueber den Einfluss des Chistenthams auf Recht und Staat*, 1841; *Die Gemeinsamkeit der Rechte und Interessen des Katholicismus*, 1847; and *Geschichte und System der Staatswissenschaft*, 3 vols., 1839.

BUSSON, Charles: b. France, 1822: a leading landscape painter, pupil of Rémond and of Français. Nearly all his pictures represent the scenery of his native department, Loir et Cher; among them are "Ford near Montoire," "Old Weir, Montoire," and "After the Rain."

BUTCHER, Samuel, D.D.: 1811–76: ninetieth bishop of Meath, Ireland; educated at Trinity college, Dublin, where he held professorships in ecclesiastical history and divinity. He was a prominent controversialist. His best known works are: *On the Present State of the Romish Controversy in Ireland*, 1855; *On the Relative Value of Human and Divine Knowledge*, 1857; *On the Conservative Character of the English Reformation*, 1862; and *Some Thoughts on the Supreme Authority of the Scriptures*, 1864.

BUTIN, Ulysse Louis Auguste: b. Saint-Quentin, France: artist, pupil of Picot and Pils: has worked very successfully with charcoal; painter of "The Departure" and "La Peche," in salon of 1877; also painter of "Saturday at Villerville —the Waiting," and many others. B. received medals in 1875 and 1878.

*BUTLER, Benjamin Franklin: formally announced himself a Democrat in the presidential campaign of 1880, and in 1882 was elected by that party gov. of Mass. He was one of the delegates to the Democratic national convention that nominated Grover Cleveland for the presidency, 1884; and was himself a candidate for the nomination. Professing dissatisfaction with the methods and result of that convention, he accepted the nominations tendered him by both the Anti-Monopoly and Greenback-Labor parties, which he united under the name of the Peoples party, and carried on a vigorous campaign, but polled a far smaller vote than was anticipated.

BUTLER, Matthew Calvin: b. S. Car., 1836: received a classical education; was admitted to the bar, 1857; elected to the state legislature, 1860; served as maj. gen. in the confederate army; lost a leg in the battle of Brandy Station, 1863; elected to the state legislature, 1866; elected as a Democrat to the U. S. senate, 1882.

BUTTERWORTH, Hezekiah: b. Warren, R I., 1839; received a common school education; taught school, and edited a local paper in his native town. Since 1870 he has been assistant editor of the *Youth's Companion*, and has written much for periodicals. His first book *Story of the Hymns*, appeared in 1875. The first vol. of the *Zigzag Journeys* appeared in 1879, followed by a vol. each year; *Story of the Notable Prayers of Christian History*, 1880; *Young Folks' History of America*, 1881; *Young Folks' History of Boston*, 1881; *Poems for Christmas, Easter, and New Year*, 1884. His cantatas *Under the Palms* and *David, the Shepherd Boy* have had a very large sale both at home and abroad.

CABALLERO, Fernan; the nom-de-plume of Cecilia Böhl de Faber: 1797–1877; b. Switzerland. She was educated in Germany, but in 1813 accompanied her father to Spain, and soon became enthusiastically attached to her adopted country. She was married three times, her last husband being a lawyer named Arrom. Her first novel, *La Gaviota*, was published, 1849, and was followed by many others the chief of which are, *The Alvareda Family*, *Clemencia*, and *Elia*. She also published the first collection ever made of Spanish popular tales and poems, *Cuentas Poesias Populares Andaluces*, 1859. Her principal novels have been translated into most European languages.

CABIN CREEK: a magisterial dist., Kanawha co., W. Va. Pop. '80, 4,773.

CABLE, George W.: b. New Orleans, La., 1845: was a clerk in his boyhood; entered the confederate army, 1863; after the war was successively errand boy, surveyor, and clerk in a cotton house. resigning the latter position in 1879 to devote himself to literature. He had written articles for the *New Orleans Picayune* without attracting much attention, but the Creole sketches which he had contributed to *Scribner's Magazine* were received with great favor, especially on their republication in book form, under the title of *Old Creole Days*, 1877. His novels, *The Grandis-*

simes, 1880, *Madame Delphine*, 1881, and *Dr. Sevier*, 1884, have fully justified the expectations raised by his short stories. *The Creoles of Louisiana* appeared 1884. He is now understood to be at work on a history of New Orleans.

CALDECOTT, RANDOLPH: b. Chester, Eng., 1846: was educated at Henry VIII.'s school in Chester. As an artist he is wholly self-taught. He has exhibited paintings and sculptures at the Royal academy and the Grosvenor gallery, but is best known by his book-illustrations, which show genial and graceful humor. In 1878 he began a series of colored picture-books, with *John Gilpin* and *The House that Jack Built*.

CALDERON, P. H.: b. France, 1833: celebrated artist; studied in London and Paris; has painted many classical and historical subjects. Among his many pictures are "Day of the Massacre of St. Bartholomew," "Victory," "Æone," "Virgin's Bower," "Young Lord Hamlet," "Queen of the Tournament," "Toujours Fidèle," and "Joan of Arc." He received a first-class medal at the Paris exposition of 1867. His "After the Battle," "Desdemona," and "The Siesta," were exhibited at the Centennial exposition, Philadelphia, 1876.

CALDWELL, CHARLES H. B.: 1838–77; b. and d., Mass.: entered the navy; became lighthouse inspector, 1855; afterwards served In the Pacific squadron. He rendered services against the Fiji islands, 1858; and, in the civil war took part in the bombardment of Forts Jackson and St. Philip and Chalmette batteries, and in the capture of New Orleans. He was made commodore, 1874.

CALDWELL, SAMUEL LUNT., D.D.: b. Mass., 1821: graduated at Waterville coll. (now Colby univ.) and at Newton theol. sem.; pastor of a Baptist church at Bangor, Me., and at Providence, R. I.; held a professorship in the Newton seminary; and in 1878, was elected to succeed John H. Raymond, LL.D., as pres. of Vassar coll. Dr. C. is an eminent historical scholar.

CALHOUN, SIMEON HOWARD: b. Mass.; d. Buffalo, N. Y., 1876. He graduated from Williams coll., 1829; was ordained to the ministry; went as missionary to Palestine where he labored with distinguished success for 40 years. He was an authority on the Arabic and Turkish languages, and assisted in making the first translation of the Bible into Turkish.

CALKINS, WILLIAM H.: b. Ohio, 1842: in the civil war was major 12th Ind. cavalry; breveted lieut. col.; prosecuting atty. for n. w. Ind., 1866; in Ind. legislature, 1870; sent to congress from Ind., 1876; Repub. candidate for gov., 1884, sharing the defeat of his party.

CALL, WILKINSON: b. Ky. 1834: became a lawyer; was elected to the U. S. senate, after the war, but was not allowed to take his seat; elected to the U. S. senate as a Dem., 1879.

CALLANDS: a magisterial dist., Pittsylvania co., Va. Pop. '80, 4,500.

*CAMBRIDGE, UNIVERSITY OF: the following regulations for the triposes came into effect, 1882: the mathematical tripos is divided into three parts. The first two parts take place in June at the close of the third year, or ninth term of residence, and the successful candidates are arranged into Wranglers, Senior optimes, and Junior optimes, the members of each class being also placed in the order of merit. Only the Wranglers may proceed to the third part of the examination in the following January. The subjects for this part are divided into four groups, excellence in any one of which entitles to the highest honor. According to their success in this examination, the Wranglers are re-arranged in three classes, the names in each class being, however, in alphabetical order. The classical tripos consists of two parts—the first, in general classical scholarship, and taking place at the end either of the second or of the third year of residence; the other, at the end of either the third or fourth year, and including, besides a further examination in pure classics obligatory on all candidates, a special knowledge of one or two of the following subjects: ancient philosophy, history, archæology, philology.

SELWYN COLLEGE, in memory of bp. Selwyn, was opened, 1882. Its object is to provide "persons desirous of academical education, and willing to live economically, with a college wherein sober living and high culture of the mind may be combined with Christian training, based upon the principles of the Church of England." The college is governed by a master and council. The present master, 1885, is the Rev. Arthur T. Lyttleton, M. A.

GIRTON COLLEGE. for the higher education of women, was opened, 1869. Candidates for admission must not be under eighteen years of age, and are examined in London and other centers. Students are not obliged to reside for the whole course of nine terms. There are six scholarships.

NEWNHAM HALL, also for women, was opened, 1880. Students are admitted to the previous and honor examinations of the university under the same conditions as men. No student who is not reading for a tripos, with a reasonable prospect of

obtaining honors, is allowed to reside at this college for more than two years without special permission. There are four scholarships.

There are, 1885, 39 professors in Cambridge university.

CAMDEN: a t. in Knox co., Maine; 40 m. s. e. of Augusta and 8 m. n. e. of Rockland; on the w. shore of Penobscot bay. It contains 10 churches, a bank, newspaper office, and manufactories of capstans, anchors, pumps, and wooden goods. The chief export is lime. Pop. '80, 4,386.

CAMDEN, JOHNSON N.: b. W. Va., 1828: admitted to the bar, 1851; appointed prosecuting atty. for Braxton co., W. Va., the same year; engaged in various business pursuits; was the Dem. nominee for governor, 1868 and 1872; was elected to U. S. senate as a Dem., 1881.

CAMERON, ANGUS: b. N. Y., 1826: graduated at National law school; removed to Wis., 1857; was a member of the state senate of Wis., 1863, 64, 71 and 72; was speaker of the legislative assembly of Wis., 1867; elected to the U. S. senate as a Rep., 1875; re-elected, 1881.

CAMERON, WILLIAM E.: b. Petersburg, Va., 1842. He entered the confederate army at a very early age and rose to the rank of adj. gen. After the war he became a journalist and edited the *Petersburg Index*. He became associated with the "readjusters," and was elected by them gov. of Va., 1881.

CAMP: a co. in n. e. Texas; formed 1874; drained on w. by Big Cypress Bayou; surface well covered with oaks and pines; soil productive. Pop. '80, 5,930—colored, 2,845. Co. seat, Pittsburgh.

CAMPBELL: a co. in Dakota, formed 1873. Pop. '80, 50—white, 29, Indians, 21.

CAMPBELL, ALLAN: b. N. Y., 1815: received a thorough education in civil engineering; laid out the route of the Harlem railroad, and was supt. of part of its construction; built a railroad from Callao to Lima, Peru, 1855; elected pres. of Harlem railroad, which office he held until succeeded by "Commodore" Vanderbilt. C. was one of the engineers chosen by the government to provide adequate means of defense for New York harbor against the expected attack of the Confederate rams in the early days of the war. He was the chief engineer in the construction of the Pacific railroad; was appointed commissioner of public works (N. Y.), 1876, succeeding Fitz John Porter; and in 1883 was confirmed controller, succeeding John Kelly, but resigning in the same year. In 1882, as the nominee of the Republicans and Independents, he was defeated by Franklin Edson in the contest for the mayoralty.

CAMPBELL, BARTLEY: b. Allegheny City, Penn., 1843: began as a journalist; founded the *Evening Mail* in Pittsburg; started a monthly magazine in New Orleans; but the success of his first play *Through Fire*, 1871, induced him to devote himself to dramatic authorship. He has since produced *Fate, Peril, The Virginians, My Partner, The Galley Slave, The White Slave*, etc.

*CANADA: the following is the value, in dollars, of the total exports and imports of the dominion for ten years:

	Exports.	Imports.
1874	$89,351,928	$128,213,582
1875	77,886,979	123,070,283
1876	80,966,435	93,210,346
1877	75,875,393	99,327,962
1878	79,323,667	93,081,787
1879	71,491,255	81,964,427
1880	87,911,458	86,489,747
1881	98,290,823	105,330,840
1882	102,137,203	119,419,500
1883	98,085,804	132,254,022

These figures are interesting for their bearing upon the question of protection, a policy which was introduced into C. through the triumph of the Liberal conservative party in the general elections, 1878. They do not fulfil the predictions of either the friends or the opponents of the measure, as they seem to show that the new policy has had only a slight effect upon the relative amount of the imports and exports. The manufacturing statistics show a steady increase, as may be seen by the following comparisons:

	1871.	1881.
Amount of capital invested	$77,964,020 00	$165,302,623 00
Value of raw material used	124,907,846 00	179,918,593 00
Aggregate value of productions	221,617,773 00	309,676,068 00
Number of persons employed	187,942	254,935
Aggregate wages paid	$40,851,009 00	$59,429,002 00
Average wages for each person	217 36	233 11

The increase of railroad lines in C. has been steady. There were 72 railroads either

completed or in course of construction at the beginning of 1884, with 9066 m. of railway in operation, and 2,299 under construction. The most important of these lines is the Canadian Pacific, which is to connect ocean with ocean, running w. from Callender Station at Lake Nipissing to Port Moody on the Pacific coast. It was projected 1871, and was begun as a public or government enterprise, 1874, but owing to political complications the work lagged until 1881, when it was taken hold of by a syndicate of American, Canadian, and some foreign capitalists, who agreed to complete it, by 1891, and keep it in operation forever, and who have pushed it forward so vigorously that it is expected the road will be finished by 1887. The region known as the Northwest territories, whose area had previously been circumscribed by the formation of the new district of Keewatin, 1876, and the shifting of the boundary line of Manitoba, 1881, was, 1882, May 8, divided into 4 provincial districts: Assiniboia, containing 95,000 sq. m.; Saskatchewan, 114,000 sq. m.; Alberta, 100,000 sq. m.; and Athabasca, 122,000 sq. m.

The merchant shipping of C., 1882, Jan. 1, numbered 7,312 vessels with a total tonnage of 1,260,777 tons, and a total value of $39,326,880. The census of 1881 returned the amount of capital invested in manufacturing industries at $165,302,623, and the average wages of Canadian mechanics at $350 per annum. The lumber trade is of great extent and value, and from 94 to 96 per cent. of its aggregate exports go to the U. S. The total money value of the fisheries in the dominion was as follows for the ten years named:

1874..$11,681,886	1878..$13,373,486	1882..$16,088,672
1875.. 10,350,385	1879.. 13,529,153	1883.. 17,215,675
1876.. 11,012,302	1880.. 14,499,980	
1877.. 11,422,502	1881.. 15,817,163	

The present gov. general is the Marquis of Lansdowne, who in 1883 was appointed to succeed the Marquis of Lorne. Since 1878 the conservative party have been in power and Sir John Alexander Macdonald has been premier. The most important event in the recent history of the Dominion is the insurrection of half-breeds in the n. w. headed by Louis Riel (q. v.) which assumed serious proportions in 1885.

CANARIS, Constantine: 1785-1877: a Greek statesman, distinguished in the war against the Turks. He was, under King Otho and King George, minister of the navy and prime minister. In 1861 he refused a pension of 12,000 francs. In 1877 he was again at the head of the ministry.

*CANCELING OF DEEDS and WILLS. It is within the jurisdiction of the courts of the U. S. which possess chancery powers to order the cancellation of a deed. But where a deed has been properly executed and delivered, its mere cancellation will not divest the grantee's title. The Statute of Frauds provides that the cancellation of a will must be by the "testator himself or in his presence, and by his direction and consent." This is true in many states of the U. S. Cancellation to be effectual must be in accordance with the statute. In N. Y. a partial obliteration is not sufficient, but the will must be destroyed or formally revoked. Cancellation by an insane man will not revoke a valid will. There must always be the *animo revocandi*, and accidental cancellation is not a revocation.

CANNON, George Q.: b. Liverpool, Eng.: received a thorough education; one of the first settlers in the Great Salt Lake Basin, now Utah territory; member of the legislative council of Utah, 1865, 66, 69, 70, 71, 72; took part in the memorial to admit Utah to the U. S.; elected to the XLIIIrd and five succeeding congresses, as the Mormon candidate. C. is a prominent Mormon bishop, and was one of Brigham Young's stalwart lieutenants.

CANNON, Joseph G.: b. N. Car., 1836: was state's atty. in Ill., 1861–68; was elected as a Republican to the XLIIIrd and to the five succeeding congresses.

CANTILEVER Bridge: a term borrowed from architecture—cantilever meaning a bracket used to support a balcony. There are two brackets in this kind of bridge, each resting on a pier, the outer ends of the brackets projecting over the water and sustaining a central span. There are four pieces of masonry; and on these are balanced two beams, resting upon the inner piers, the shore ends of the beams being fastened to the two extreme piers; while another span rests upon their outer ends. For bridges with long spans the cantilever system is thought to be the most economical, as less material is needed than in other kinds, and very little scaffolding is required. The central span may contract or expand without danger. As one end of the central span is fastened to one of the brackets, and the other placed on rollers, the deflection from the horizontal, as compared with the suspension bridge, is very small. The principle of the C. B. was undoubtedly known to the ancients. The first plan designed in this country was by Charles McDonald, in 1875, for a proposed bridge over the East River at Blackwell's Island. The first C. B. built in this country, and the first of any magnitude in the world, was the new structure over the Niagara river in 1883. There is a large C. B. over the Firth of Forth; and one across the Ohio river, connecting Louisville and New Albany.

CANTON: a tp. in Norfolk co., Mass. In this tp. is Canton, a post-vill. on the Neponset river, and on the Stoughton branch of the Boston and Providence railroad. There are 5 churches, a bank, high school, savings-bank, besides large manufactories of sheet copper, machinery, bar iron, woolen jackets, axles, and cotton goods. Pop. '80, 4,516.

*CAOUTCHOUC: the census of 1880 gives the number of establishments in the U. S. manufacturing rubber and elastic goods as 90, with a capital of $6,057,987; employing 6,268 hands; paying in wages for the year, $2,295,972; consuming material worth $9,249,967; and producing goods valued at $13,751,724.

*CAPEL, THOMAS JOHN, D.D.: visited America for the second time, 1883, and made an extended tour through the U. S., lecturing in many cities upon the dogmatic teachings of the Rom. Cath. church. He engaged in a spirited controversy, 1884, with several clergymen of other denominations, and published "*Catholic,*"—*An Essential and Exclusive Attribute of the True Church.* For replies to this able defense, see articles by J. H. Hopkins, D.D., in the *American Church Review*, 1884, Oct., and 1885, Jan.

CAPERTON, ALLEN TAYLOR: 1810–76; b. Monroe co., Va.; d. Washington. He graduated at Yale coll., 1832; studied law at Staunton, Va.; was for several years a Whig member of the Va. house of delegates, and of the state senate; member of the state constitutional convention of 1861; served in the confederate states senate till 1865. He was active in bringing the resources of W. Va. to the notice of outside capitalists. He was elected U. S. senator as a Dem., 1875.

CARBIDES: compounds of carbon with a metal. None occur in a natural state, and they are difficult to obtain in a definite form. Carbon makes the metal hard and brittle. [From *Chambers Encyclopædia.*]

CARCHEMISH: an ancient city frequently mentioned in the Scriptures as the capital of the Hittite nation. Biblical scholars were formerly inclined to look upon it as the classical Circesium, but recent Assyriological investigations have identified it with the modern Jerablûs or Jerablis, a village on the Euphrates river not far from Biredjek. The period of its greatest splendor was abt. B. C. 1100–850. It seems to have been the birthplace of that modified type of Assyrian art which specially characterizes the early monuments of Asia Minor.

CARLETON, WILL.: b. Hudson, Mich., 1845: graduated at Hillsdale coll., 1869; has published *Farm Ballads*, 1873; *Farm Legends*, 1875; *Young Folks' Centennial Rhymes*, 1876; *Farm Festivals*, 1883.

CARLISLE, JOHN G.: b. Ky. 1835: received a common school education, and taught school. He was admitted to the bar 1858; was elected to the lower house of the legislature, 1866, and to the state senate, 1866 and 1869; was lieut. gov. of Ky., 1871–75; was presidential elector, 1876. He was elected to congress in 1877, and became prominent by his advocacy of revenue reform, and by his services on the committee of ways and means. C. was elected speaker of the house in 1883. He is regarded as one of the leading advocates of free trade, although he has declared that he favors only an approximation to the free trade standard. He is also an earnest advocate of the revival of the shipping interests of the U. S.

*CARLYLE, THOMAS: died, 1881, Feb. 5, in his 86th year, leaving a splendid reputation not only as a thinker and teacher, but also as one whose life, in all essentials, had conformed to his noblest teachings. He had appointed James Anthony Froude his literary executor. In conformity with the terms of this trust Mr. Froude published *Carlyle's Reminiscences*, 1881; *Thomas Carlyle: the First Forty Years of his Life*, 1882; *Letters of Jane Welsh Carlyle*, 1883; and *Thomas Carlyle: Life in London*, 1884. Literary history furnishes no parallel for the sudden revulsion of feeling which followed the first of these publications, and which was deepened and widened by those succeeding. Men who had been inclined to look with kindly tolerance upon Carlyle's contempt for the "poor, brute chaos of a world" were outraged to find that he had considered them or their relations a part of the chaos. Others, who had no such personal concern, were shocked at the bitterness and spite which abounded in these records, and which made the whilom idol appear not merely human, but absolutely inhuman. A cry of indignant protest went up from the journals throughout England. The plea that C. was a man of genius tormented by dyspepsia, and therefore only partially responsible for the wild utterances wrung from him, was contemptuously set aside. A subscription that had been started for a monument was abandoned. Mr. Froude himself was glad to leave England on short continental tours, to escape the obloquy visited on his indiscretion. C.'s fame can never be re-instated on its former pedestal, but after the clouds of the present controversy have rolled away he will, no doubt, be revered not merely as one of the greatest literary forces of the century but as one who set before himself a high ideal of conduct, and, against a nature and circumstances alike unfavorable, struggled bravely, though not always successfully, to attain it.

CARNEGIE, ANDREW: b. Dumfermline, Scotland, 1835. His family emigrated to the U. S., 1845, and settled in Allegheny, Penn. He was set to winding bobbins in a cotton factory; became later a messenger in the then Atlantic and Ohio telegraph co., working himself up to supt. He made a fortune in oil; became interested in iron works at Pittsburg, Penn., and is the largest manufacturer of iron, steel rails, and coke, in the world. He gave a free library and baths to his native town, built the Carnegie laboratory for the New York Bellevue medical coll., and has offered a free library to Pittsburg. Recently he has become interested in English politics, has bought up several English papers, and has been asked to stand for several constituencies in parliament, but has declined to enter public life. He has published *An American Four-in-Hand in Great Britain, Round the World*, and has contributed articles to leading periodicals. One of his books describes in a felicitous manner a long coaching-trip on which he invited a party of English and American friends. He has a keen and active mind, with decided tendencies to radical principles, yet with a balanced judgment in practical affairs. He is a genial friend, and a public-spirited citizen.

CAROLUS-DURAN, ÉMILE AUGUSTE: b. Lille, France, 1838: portrait painter, pupil of Souchon. While living with the monks of Subiaco, at Rome, he painted "Evening Prayer" (in the salon of 1863); received first medal for his "Victim of Assas"; has been made chevalier of the legion of honor, and elected to the order of Léopold. C. will be chiefly remembered as a portrait painter. His style is so subtle, vigorous, and original, that the critics, unable to classify him, content themselves with admiration.

*CARPENTER, WILLIAM BENJAMIN, M.D., LL.D.: in 1879 resigned the registrarship of the univ. of London, which he had held since 1856, in order to devote his entire time to original researches. He visited the U. S., Sept., 1882, attended the Unitarian convention held at Saratoga, and delivered a course of lectures before the Lowell institute at Boston.

CARR, JOSEPH B.: b. N. Y., 1828: educated at Troy. In the civil war he was made lieut. col. of the second N. Y. regiment, the first volunteer regiment to leave the state; was made a brig. gen. in 1862, and a brevet maj. gen. in 1865. In 1879 he was the candidate of the Republicans for sec. of state, and was elected by a small majority.

CARROLL, JOHN LEE: b. Md., 1830; grandson of Charles Carroll, of Carrolton: educated at Georgetown coll., D. C., Emmettsburg, Md., and Harvard law school; was U. S. commissioner in New York, 1859; elected to Md. senate, 1867; re-elected, 1871; gov. of Md., 1875, entering upon his duties on the 100th anniversary of the signing of the Declaration of Independence by his grandfather.

CARRUTHERS, ROBERT, LL.D.: 1799–1878; b. Dumfries, Scotland. He was, from 1828 editor, and from 1831 proprietor of the *Inverness Courier*. He was associated with Robert Chambers in editing the *Cyclopædia of English Literature*, and wrote nearly all the original portion of the work, contributed many articles to the *Encyclopædia Britannica*, and published a *Life of Pope*, and an edition of *Pope's Poetical Works*.

CARSON: a co. in Texas "Panhandle," formed 1876; unorganized, and attached to Wheeler co. for judicial purposes: drained by the n. fork of Red river: 900 sq. m.

CASSERLY, EUGENE: 1822–83; b. Ireland: graduated at Georgetown coll., D. C.; admitted to the bar, 1844. He went to California and became prominent as a Democratic politician and editor. In 1869 he was elected U. S. senator from Cal., which position he resigned, owing to ill health, in 1873.

CASSIA: a co. of Idaho, formed 1879. Pop. '80, 312—Chinese, 22.

CASSIDY, GEORGE W.: b. Ky. 1836: elected to Nevada senate, 1872; re-elected, 1876; elected as a Democrat to XLVIIth and XLVIIIth congresses. C. is a journalist.

CASTRO: a co. in n. w. Texas, formed 1876: unorganized, and attached to Wheeler co. for judicial purposes: drained by Red river: 900 sq. m.

CATASTROPHISM: the doctrine that vast geological changes, with the correspondent changes in living forms, were sometimes due to catastrophes, such as the upheaval of mountains, the sudden disturbance of seas, strata, etc.: opposed to Uniformitarianism. The advocates of C. claim that the changes which have taken place in types are not sufficiently explained by evolution and natural selection, as taught by Huxley, Darwin, and many others; and that the importance of environment as a factor in these changes has been overlooked. The "moments of great catastrophes become moments of creation," and out of plastic organisms the new forms are born.

*CATTLE PLAGUE. Several outbreaks of splenic or "Texan" fever (rinderpest) have occurred in the U. S. during the last few years. An epidemic raged in Ohio, 1877; and the fever destroyed much valuable stock in New York, 1882. The herds were quarantined, and the sale of meats from the infected districts was prohibited.

Carnegie
Cedar Hill.

In this disease the animals are covered with ticks whose bite is deadly, as it impregnates the blood which flows to the liver, destroying the membrane and damaging the functions of the kidneys and bladder. The symptoms of C. P. are: a decided diminution of milk, and the presence of blood in the urine. In 1883, the board of medical and scientific experts, appointed by the agricultural department to prepare a report on the epidemic diseases among cattle in the U. S., said that the propagation of splenic fever among cattle in the southern Atlantic and Gulf states occurs only in summer, or early autumn, and seldom after a heavy frost. The British market was closed in that year against importations of American cattle; and the Treasury cattle commission concluded its report thus: "Nothing short of the absolute and undeniable extinction of this disease in the U. S. will reopen the British market to our live cattle." This disease is frequently confounded with pleuro-pneumonia, which has, up to this time, confined its ravages to the states east of the Alleghanies. The seat of the plague, in pleuro-pneumonia, is the lung. The commission appointed, 1882, reported that the ultimate source of lung plague was unknown; that it had prevailed in Europe from time immemorial, that it was brought to this country, 1848, by an infected cow. landed in Brooklyn; that it is invariably epidemic, never sporadic; and that consequently, if once exterminated, it will not appear again, unless through fresh infection. Pleuro-pneumonia was very prevalent in N. J. and N. Y., 1879. Prof. Law, of Cornell univ., was commissioned by the governor of N. Y. to investigate the disease, and, in connection with Gen. Patrick, rendered valuable services in securing its extermination—the state appropriating $10,000 for this purpose. Up to 1879, the British loss from C. P. is estimated at $500,000,000; and Prof. Law claims that if the contagion in this conntry should ever become general, it would be more expensive than a civil war. Our yearly losses, from the lung plague alone, are estimated at from $2,000,000 to $3,000,000, and the prospective loss at $50,000,000. Purulent discharge from the nose is always a sign of an aggravated attack of pleuro-pneumonia; and cattle showing this symptom should invariably be killed. Inoculation at the tail of healthy animals, as soon as the disease appears in a herd, has been practiced with success; but Prof. Law disapproves of the custom, as the virulent poison is apt to be diffused through the air in the process, lodging in the fodder, etc., while the inoculation gives immunity for two years only. Carbolic acid administered in a very diluted state, in drinking water, and sprinkled about, in a crude form, destroys infection, killing the virus, as well as acting as a disinfectant. It should be placed in water, in the proportion of one part of pure acid, with thrice its weight of sal soda, to 1,000 parts of water. Some preventive legislation has been attempted on this important subject; but the prompt action of some states, as N. Y., in endeavoring to stamp out the disease, has been offset by the negligence of other commonwealths in not providing proper laws for the protection of cattle. During the epidemic of 1879, the absence of legislation in Va., Del., and Md., rendered the success of the efforts of the N. Y. authorities very dubious. A bill was before the U. S. senate, 1881, to prevent the introduction and dissemination of communicable diseases among domestic animals. It prohibited, under heavy penalties, the introduction of diseased meats from foreign countries, or their transfer from state to state; and it authorized absolute embargo against the importation of meats from infected states. A somewhat similar bill was passed by both houses of congress, 1883.

CAVENDISH, ADA: b. England, abt. 1845. Her American debut as actress was at New York, 1878, as Mercy Merrick in "The New Magdalen."

CAVENDISH COLLEGE: founded, 1873, by the County College association of Cambridge univ., in order to enable young undergraduates to pass through a university course at the least possible cost of money and time; and to make a specialty of the art of teaching. The present buildings of the college were begun ,1876. There are accommodations for 300 undergraduates. There were, 1884, about 80 students in residence. The president of C. C. is William Cavendish, LL.D., duke of Devonshire, who is also the chancellor of the university.

CAVENDISH, FREDERICK CHARLES, Lord: 1836–82; second son of the Duke of Devonshire: was educated at Trinity col., Cambridge; and became private sec. to Lord Granville, 1859. He represented the West Riding of Yorkshire in Parliament, from 1865 to the day of his death. Under Gladstone he was appointed financial sec. to the treasury, having already become a Lord of that department. C. was appointed chief sec. of Ireland, 1882, succeeding Forster, but was assassinated almost immediately upon his entrance into office. C. was greatly esteemed, and his record gave warrant to the belief that his policy in this difficult post would be both creditable to England and helpful to the suffering in Ireland. The assassination was denounced by the Irish press and home-rulers.

CAVILEER, or CAVILIER: a co. in n. Dakota; formed 1873, unorganized; 1,448 sq. m.

CEDAR HILL (formerly Cedar Springs): vill. in Spartanburg co., S. Car.: on the Spartanburg and Union railroad, 90 m. n. w. of Columbia. It contains an educa-

tional institution for the blind, deaf, and dumb, founded by the state, 1855. Pop., vill. '80, 124.

CERNUSCHI, Enrico: b. Milan, Italy, 1821: took part in the Italian revolution of 1848–49; was an ardent republican, and assisted Garibaldi in the defence of Rome. He went to France in 1850 and engaged in banking business; became one of the chief stockholders of *Le Siècle*, in which he discussed economical questions with great ability, opposing the Socialists. This course exposed him to the risk of being shot, first, by the communists and, upon their suppression, by a Bonapartist general. Disgusted, he left France and visited Egypt, China, and Japan, collecting and bringing back so many valuable works of art as to make his residence in Paris a veritable museum; returned to Paris in 1873; in 1876 visited England; and in 1877 the United States, where he delivered several addresses on economical questions. He has published *Réponse à une accusation portée par M. de Cavour*, 1861; *Mécanique de l' échange*, 1885; *Contre le billet de Banque, dépositions et notes*, 1866; *Illusions des Sociétés co-opératives*, 1866; *Discours*, 1871; *Or et argent*, 1874; *La Question monétaire en Allemagne*, 1875; *Silver vindicated*, 1876; *M. Michel Chevalier et le bimétallisme*, 1876; *Le Bland bill*, 1878; *Les Projets monétaires de M. Say*, 1879; *Le Bimétallisme à 15½ nécessaire*, 1881.

CETEWAYO, Cetywayo, or Ketchwayo, king of the Zulus: d. Natal, 1884. His succession to the throne was decided by combat with his brother Umbulazi, in which the latter was killed. His warlike government was in strong contrast with that of his father, Panda, or Umpande, who had been friendly to the English colonists. In 1879, he raised an army of 50,000 men, which he refused to disband at the command of Sir Henry Bulwer, the colonial governor of Natal. The British under Lord Chelmsford, thereupon invaded Zululand, and though at first defeated with great loss, soon gained the victory at Ginghilovo, resulting in the surrender of the Zulus and the capture of C. In this campaign, Prince Napoleon, who had engaged in the British service, was killed. C. was sent to England, but in 1882 was restored to his dominion, then in charge of a British resident. His former subjects rose against him in 1883, and he d. in captivity in the following year.

CHADWICK, John White: b. Mass., 1840. Leaving school at the age of 13 years, he worked at the trade of shoemaking until 1857, when he entered the normal school. He afterward graduated from Exeter academy and the Harvard divinity school. He has been pastor of the second Unitarian society in Brooklyn since 1864. C. is one of the leaders of the rationalistic school of Unitarianism. His works are: *A Book of Poems; The Bible of To Day; The Faith of Reason; The Man Jesus; Some Aspects of Religion; Belief and Life*, and many articles in magazines.

CHAFFEE: a co. in Colorado, formed 1879; pop. '80, 6,512.

CHAFFEE, Jerome B.; b. N. Y., 1825: received an academic education; elected to Colorado legislature, 1861, 62, 63; speaker of the state house of representatives; elected as a republican to XLIId. and XLIIId. congresses; U. S. senator in 1876, upon the admission of Col. as a state.

CHAILLÉ-LONG, Charles: b. Md., 1840: served in the federal army during the civil war, and on the general staff of the Egyptian army 1871, 2, with rank of Lieut.-col. In 1874 he was made second in command of the force operating for the suppression of the slave trade on the White Nile, under General Charles G. Gordon. In 1874, 5, he visited the country and court of Uganda, and explored the upper waters of the Victoria Nile. In 1876 he commanded the Egyptian expedition which occupied and annexed Zoulla in East Africa. In 1882 he became U. S. vice consul at Alexandria, Egypt; and rendered important services during the Alexandria massacre, and subsequent bombardment by the English squadron, for which he received the order of the Mejidja from the khedive. He has written *African Travels* and *The Three Mahdics.*

CHAIX D'EST ANGE, Gustave Louis Victor Adolphe Charles: 1800–76: a French barrister; appointed *procureur général* at the imperial court, Paris, 1857; also councilor of state, and senator of the empire. In 1863 he was vice-pres. of the council of state; and in 1864 was appointed pres. of public works and fine arts. He was made a commander of the Legion of Honor, and, in 1881, a grand officer. As a commissioner of the government he presented to the senate, 1868, a report on the petition of the Rom. Catholics, demanding free superior instruction. He was also prominently engaged in the events of 1830 and 1848.

CHALLEMEL-LACOUR, Paul-Amans: b. 1827. He was prof. of philology at Pau, France, when only 22 years of age; was a brilliant journalist, and with Targé and Ranc founded the *République Francaise*, the great liberal paper of Paris. He was a noted republican, and a strenuous opponent of the second empire, having been banished as early as 1852 for his political opinions. He has written an essay on Hamboldt, translated Ritter's *History of Philosophy*, and edited the works of Madame d'Epinay. He was prefect of the Rhone, and commissioner extraordinary for the Republic during the Franco-Prussian war.

CHALMERS, JAMES RONALDS: b. Va., 1831: removed to Miss., 1839; admitted to the bar, 1853; elected dist. atty. of the seventh judicial district of Miss., 1858. He was a general in the rebel army; was a member of the state senate of Miss., 1876, '77; was elected as a Democrat to the XLVth, XLVIth and XLVIIth congresses, and (having left the Democratic party) as an Independent, to the XLVIIIth congress. He was deprived of his seat in the XLVIIth congress, and was deprived of his certificate of election to the XLVIIIth congress, as he claimed, through an illegal count.

CHAMBERLAIN, DANIEL HENRY: b. West Brookfield, Mass., 1835: graduated at Yale coll., and at the Harvard law school; entered the union army and served until 1865, principally on staff duty. He settled in Charleston, S. C.; was a member of the state constitutional convention, 1867–8; atty.-gen. 1868–72; and gov. 1874–76. He was inaugurated a second time, but his election was successfully contested and he relinquished his office, 1877, and removed to New York to practice his profession. He has written for the *North American Review*.

CHAMBERLAIN, JOSEPH: b. 1837: educated at Univ. coll. school, London; has been active in English politics; and has occupied many positions of trust in Birmingham, of which city he was thrice elected mayor. He has represented Birmingham in parliament since 1876; and is known as a radical in politics, advocating the disestablishment of the Church of England, and the establishment of national compulsory secular education. He is (1885) in the cabinet of Mr. Gladstone; and is pres. of the board of trade.

CHAMBERSBURGH: bgh. and tp. (co-extensive) in Mercer co., N. J.; where is situated a house of the Minor Conventuals (Rom. Cath.) of St. Francis; also an academy and hospital under charge of ladies of the Franciscan Tertiary Order. Pop. '80, 5,437.

CHAMPLIN, JOHN DENISON: b. Stonington, Conn., 1834: graduated at Yale coll., 1856. He studied law in Litchfield, Conn., was admitted to the bar there in 1859; in 1862 began literary work; in 1864 was assoc. ed. of Bridgeport (Conn.) *Daily Evening Standard;* 1865–69 was ed. of Litchfield (Conn.) *Sentinel*. He edited *Fox's Mission to Russia* (New York, 1873), and, 1873–77, was one of the corps of editors of Appleton's *American Cyclopædia;* author of *Young Folks' Cyclopœdia of Common Things* (New York, 1879), *Young Folks' Cyclopedia of Persons and Places* (1880), *Young Folks' Astronomy* (1881), *Young Folks' History of the War for the Union* (1881).

CHANDLER, JOSEPH R.; 1792–1880: b. Kingston, Mass.: removed to Philadelphia and founded there the *United States Gazette*, which he edited for many years. He was a highly respected citizen, a representative in congress from Penn., 1849–55, and was appointed minister to Naples 1858.

CHANDLER, WILLIAM E.: b. N. H., 1835: graduated from Harvard law school, 1855; was speaker of N. H. legislature, 1863–4; appointed judge-advocate-gen. of the navy dept., 1865; first asst. sec. of the Treasury under Sec. McCulloch for two years; appointed secretary of the navy by Pres. Arthur, 1882.

CHAPIN, CHESTER W.: 1798–1883; b. Mass.: engaged in mercantile pursuits; elected as a Democrat to XLIVth congress; defeated, as a candidate for XLVth congress. He was for many years a resident of Springfield, Mass., and the very successful pres. of the Boston and Albany railroad.

CHAPIN, HENRY: 1811–78; b. Mass.: graduated Brown univ., 1835; admitted to the bar, 1838; elected to the state legislature, 1845; mayor of Worcester, 1849, 50; member of the constitutional convention, 1853. He was judge of the court of probate and commissioner of Insolvency; and was pres. of the American Unitarian association.

*CHARITABLE USES, and LAW OF CHARITIES. These are gifts to general public uses, and embrace gifts to the poor of every class; for every description of college and school, and their instructors and pupils, to all churches, chapels, hospitals, orphan asylums, and to other charitable purposes general in their character. With some striking exceptions, the decisions of the English chancery upon trusts for charity have furnished the rule for adjudications in our own courts. There is, however, a wide difference in the various states as to the statutes upon this topic. In N. Y., for example, the limitations upon such trusts are very strict. It is said generally, however, that charitable uses are favorites with courts of equity and that the construction of all instruments in which they are contained is liberal in their behalf.

CHASE: a co. in s. w. Nebraska, formed 1873; surface level, with little timber; pop. '80, 70.

CHASE, WILLIAM M.: b. Ind., 1849: portrait and figure painter. He studied in this country and abroad, a pupil of Wagner and Piloty. His best known works are "The Dowager," "Broken Jug," "Court Jester," which received a medal at the cen-

tennial exposition, and "Ready for the Ride," now in the Union League club, New York.

CHATARD, Francis Silas, D.D.: b. Baltimore, 1834: educated Mt. St. Mary's coll., Emmittsburg, Md., at the univ. of Maryland, and at the Urban coll., Rome. He was private chamberlain to pope Pius IX.; rector of the American coll. at Rome; and was consecrated Rom. Cath. bishop of Vincennes, Ind., 1878. He is the author of *Christian Truths*, and of various essays, discourses, and translations.

CHATHAM: a tp. in Morris co., N. J. Pop. '80, 4,276.

CHATHAM: a magisterial dist., Pittsylvania co., Va., including Chatham vill.: traversed by Virginia Midland railroad. Pop. '80, 6,463.

CHAUTAUQUA: a co. in s. s. e. Kansas, formed 1875; intersected by Big Caney and Middle Caney creeks: surface level; soil productive; chief product, Indian corn. Pop. '80, 11,059—colored, 144. Co. seat, Sedan.

CHAUTAUQUA: a village in Chautauqua co., N. Y., the scene of one of the most successful religious and educational experiments of this century. In 1874, Lewis Miller, of Akron, O., and the Rev. J. H. Vincent, D.D., of New York, formulated and put into execution a plan which they, with many others, had long cherished, of centralizing and popularizing religious work. The original scheme of the founders was to bring together, every summer, at some suitable summer resort, those interested in Sunday schools and in missionary enterprises. The little village of C., beautifully situated in s. w. N. Y. on the navigable lake of that name, which is at the extraordinary height of 1,382 ft. above tide, was most happily chosen for the rendezvous; and on the bluff overlooking the water, ground was secured, since enlarged to 150 acres, and adorned by a spacious hotel, costing $100,000, 500 cottages, and several lecture halls and public buildings. The village is now lighted by electricity; the water-supply, coming from the bottom of the lake, is pure; and the sewerage system is the perfect work of competent engineers. Eminent lecturers upon biblical and social subjects were early secured; and the enjoyment of the guests was enhanced by a constant round of literary and social opportunities. So successful were these meetings, for purposes of devotion or instruction, that the plan was enlarged, 1878, to include a literary and scientific circle, the object of which was to promote habits of reading and study among its members. A course of reading is prescribed, which, with forty minutes devoted to it daily, may be finished in four years, and which has met with excellent results, especially among those whose educational advantages have been limited. At the first commencement, 1882, Aug. 12, 1,600 graduates received diplomas. 25,000 persons now belong to the literary circle; and there are local societies at many places, which nourish throughout the remainder of the year the spirit of enthusiastic work so carefully inculcated at the summer meetings. These meetings last for six weeks, and are occupied with the exercises of the various branches of the association, *viz.*, the "School of languages," the "Missionary institution," the "Sunday school assembly," and the "Literary and Scientific circle." A "Teacher's retreat" is also held, to which the members of the association who are teachers gather for consultation and recreation. Dr. Vincent is still chancellor of the society.

*CHECK. No stamps are now required on checks in the U. S. The term is almost exclusively applied to the drafts used between banks and bankers and their customers. There is in this country a system of marking checks as "good" or "certified," by the banker. These are called "certified checks." The bank upon certification becomes a debtor to the holder, not the drawer. It has been decided in N. Y. that by certifying a check the bank engages, that the signature is genuine and that the maker has that amount of money in the bank which will be retained to meet that check.

Crossed Checks are not known in the U. S. Where it is known to the maker that the payee wishes to deposit in a certain bank, the same effect as in a crossed check may be obtained by endorsing the check on its back for deposit in that bank.

*CHEESE. The annual product of C. in the U. S. amounted, 1885, to over 400,000,000 lbs. The Gruyere and Limburger varieties are now made, as well as the Cheddar; and the manufacture of Neufchatel and other soft French C. is a growing industry in some of the states. "Imitation C.," made from skimmed milk, has lately come into popularity. The milk is cooled quickly in vats, with spring water at 50° F.; here it remains from 24 to 30 hours in summer, and 12 hours in winter. The butter-milk and the skimmed milk are then mixed, from which product the C. is formed. To replace the loss of fat, oleomargarine oil, or lard, is used. The "Cooley Emulsifier" is a very ingenious machine by means of which the "artificial" cream is added to the skimmed milk. Cans of oil and milk are placed on top of the machine, which, by rapid revolutions, sets them flowing, and directs the stream in such a way as to cause them to mingle in a thorough emulsion, forming a thin cream. C. of a fair quality is thus made, although, of course, inferior to the best whole-milk cheese.

CHELIUS, MAXIMILIAN JOSEPH: 1794–1876: a distinguished German surgeon; received his medical degree at the age of 18, having studied at Mannheim and Heidelberg; practiced in many European cities with eminent success; and occupied the chair of medicine at Heidelberg. He wrote *Handbuch der Chirurgie*, which passed through many editions, *Ueber die Heilung der Blasenscheidenfisteln durch Cauterisation*, and *Zur Lehre von den Staphylomen des Auges.*

*CHEMISTS AND DRUGGISTS, LAWS RELATING TO. There is no recognized distinction in law in the U. S. between chemists and druggists, and there is no general law regulating their practice. The laws of many states and the local ordinances of most cities prescribe certain conditions under which they are allowed to compound prescriptions, etc. In general they are required to have a license for that purpose, to obtain which they must show themselves to be properly qualified, sometimes by an examination before a board, and often by the production of a diploma from a college of pharmacy.

CHENERY, THOMAS: 1826–1884; b. in Barbadoes: educated at Eton and Cambridge; prof. of Arabic at Oxford, 1868–9; was appointed one of the revisers of the Old Testament, 1870; honorary sec. to Royal Asiatic soc. C. was one of the most thorough Arabic scholars in England, and will be remembered chiefly by his translation of *The Assemblies of Al Harui* and his edition of *Machberoth Ithiel*, 1872. He was the successor of Mr. Delane as editor of the London *Times*, 1877.

CHENEY, SETH: 1810–1856; b. Conn.: famous as artist of female heads in crayon. To him is attributed the initial movement of crayon work in this country.

CHENEY, WARD: 1813–76; d. South Manchester, Conn. At an early age he became identified with silk industries; was in the raw silk business at Burlington, N, J., and established the firm of Cheney Bros., at South Manchester, now employing a vast number of operatives. He was at the time of his death pres. of the American Silk association. Mr. C. was noted for public spirit.

CHESAPEAKE: a magisterial dist. of Elizabeth City, Va.; pop. '80, 5,070. Chesapeake City is a vill. in same co.; on Chesapeake bay, near Fortress Monroe; with 3 churches and a Soldiers' Home. (P. O., National Soldiers' Home.)

CHEYENNE: a co. in Dakota, formed 1875; unorganized. Pop. '80, 37.

CHEYENNE: a co. in n. w. Kansas, formed 1873; intersected by Republican river; 990 sq. m.: pop. '80, 37.

CHILCOTT, GEORGE M.: b. Penn.: farmer and lawyer; served in state legislature of Neb. and Col. in 1856, and 1861–2. He served four yours as register of the U. S. land office for the Col. district; elected from Col. to congress, 1865, but not admitted. He was elected delegate to XLth congress, and was appointed to succeed Senator Henry M. Teller in the XLVIIth congress.

CHILDERS, HUGH CULLING EARDLEY: b. London, 1827: formerly secretary of state; now chancellor of the exchequer, in Mr. Gladston's cabinet. He graduated from Trinity col., Cambridge. Emigrating to Australia he there made a study of politics. He was appointed commissioner of trade and customs in the Australian cabinet. He returned to England, 1857, and stood as the liberal candidate for Pontecraft, gaining the seat after some legal opposition. C. became a lord of the admiralty, 1846, and financial secretary of the treasury, 1865. In 1872, he re-entered the ministry as chancellor of the Duchy of Lancaster. C. has written in behalf of free trade and national education; and is a fellow of the Royal society.

CHILDREN, SOCIETIES FOR THE PREVENTION OF CRUELTY TO. Organizations now exist in many of the states having for their object the proper protection of children against the cruelty of parents and guardians, as well as against the illegal demands of corporations and employers. Bills have been passed in the state legislatures, often largely through the influence of these societies, limiting the age of minors employed by manufacturers, and also the working hours of children and women in mills and factories. In Mass. children under 14 years of age are forbidden employment in manufacturing, mechanical, and mercantile establishments, while the public schools are in session, unless they can read and write. In N. H., an act has been passed prohibiting the employment of children under 10 years of age. In Mich., the employment of children under 10 years of age by showmen, the giving of obscene books, pamphlets, etc., to minors, and the exhibition of the same in view of passing children, are prohibited, In N. Y., by a bill passed in 1885, ten hours are made the limit of daily work in factories for minors and women; and children under 12 years of age, unable to write, are prohibited employment. All these and similar laws, the societies for the prevention of cruelty to children are authorized to see enforced; and in the performance of their work they may call upon magistrates and officers of police for aid.

CHILDRESS: a co. in Texas, bordering Indian Terr. on e. and n. e.; formed 1876; unorganized, and attached to Wheeler co. for judicial purposes; drained by Red river: 875 sq. m. Pop. '80, 25.

CHILTON.: changed since 1870 from BAKER (q. v.); a co. in central Alabama, having Coosa river on the e.; intersected by South and North Alabama railroad. Pop. '80, 10,793—2,142 colored. Productions, corn, wheat, oats, cotton, and sweet potatoes. Co. seat, Clanton.

*CHINESE EMPIRE. As the official census of 1812 is still the latest, it is impossible to state the present population with any degree of accuracy. But an approximate estimate gives the number of inhabitants in the empire as 380,000,000 and in China itself as 350,000,000. Larger estimates have sometimes been made, but they err in basing their figures entirely on the densely crowded provinces near the seaboard, whereas in the interior the population was always much thinner and has recently been decimated by the famines of 1876–78. The area of the empire is now placed at 11,767,583 sq. kilometers. Foreign commerce is still confined to the treaty ports, which now number 22, and is crippled by the system of customhouse duties, taxing exports as well as imports. In 1881 the total value of all exports was $100,034,163 and of all imports $118,674,527; the duties on the former were $11,661,555, and on the latter $7,002,815. The chief exports are tea, silks, raw silk, and sugar; the chief imports opium, cotton and linen goods, and metallic wares. The mental condition of the people is stagnant and even retroactive. They steadily set their face against all innovations on the established order. It is true that the foreign quarter of Shanghai now has the advantages of gas, street railways, and telephones. It is true also that a short telegraphic line has been established between Shanghai and Wusung, and that steps are now being taken to connect Pekin in the same way with Shanghai. But all these improvements have been in the face of violent opposition. In 1876 an English company purchased ground extending from Shanghai to Wusung for the purpose of building a railroad, and had actually commenced laying the rails, when the local government interfered, bought up the ground and transferred the rails to Formosa. The introduction of labor-saving machinery in general is opposed on the primitive ground that it would interfere with the rights of the laborer. The relations of China with the U. S. were in 1881 placed on a new basis by a treaty which modified the so-called Burlingame treaty of 1868. That treaty had allowed the unrestricted immigration of Chinese into the U. S. But the evils which followed, it was claimed, from the landing here of a class of laborers who could afford to work at far less wages than would suffice for the support of the white laborer had induced congress to pass a law restricting Chinese immigration. The new treaty was consequently negotiated with the Chinese empire by James B. Angell. China agreed to allow for a reasonable period the restriction of immigration of its unskilled labor, provided free ingress to the U. S. were granted to its merchants, scholars, etc., and provided also that the U. S. would instruct its merchants to comply with the laws by which China regulated commerce within her own ports. Furthermore, no opium is to be carried to Chinese ports in American vessels or by American merchants. Encouraged by the successful issue of these negotiations with the U. S., China subsequently demanded a revision of its treaties with other countries, and especially with Great Britain, with a view to abrogating the opium monopoly which that country enjoys through its provinces in India. Though the demands of China are supported by a considerable number of philanthropic thinkers in England, they involve so large a sacrifice of British interests, that the government has shown no willingness to accede to them. In 1879–81 there seemed to be danger of a rupture between Russia and China. Russia had, in 1871, with the consent of the Chinese government, occupied the province of Kuldja, which had joined to a certain extent in the Moslem uprising that threatened the peace of the adjacent Russian frontier provinces. When the rebellion was suppressed, 1877, the Russians delayed to return the province, and finally, 1869, a treaty was signed at St. Petersburg between the Russians and the Chinese envoy, allowing Russia to retain permanent possession of Western Kuldja on payment of 5,000,000 rubles. The treaty was indignantly repudiated by the Chinese government, and for a time war seemed imminent. But in 1881 a new treaty was agreed upon, which restored the province, with the exception of a small district, to China on payment of the costs of occupation and the granting of certain privileges to Russian trade. The recent troubles with France in regard to the Tonquin have also had a favorable result. The Tonquin is a province nominally under the control of Annam, which in its turn is a vassal of China. But outside of the large cities the inhabitants have maintained a certain independence. In 1872 a French adventurer named Depuis, who had recently explored the region under the auspices of the Chinese government, raised a filibustering expedition, captured the principal city Hanoï, and invited the French governor of Cochin-China to assist him in subduing the entire province. The invitation was accepted and French rule was in a short time established over the Tonquin. But the next French governor concluded a treaty, 1874, which recognized the rights of Annam over the province, and he assisted in driving Depuis from the territory. In 1883, however, France re-asserted her rights over the Tonquin, set aside the treaty of 1874, and in despite of the protests of China proceeded to subjugate the province by force

of arms. War was therefore declared between the two powers. France, at first successful, though at a great sacrifice of men to the miasmatic climate, was, in the end, defeated at the battle of Langson, and negotiations for peace have been made.

CHIRICAHUA INDIANS: a tribe of North American Indians belonging to the Apache family. In 1883, the C. made trouble among the settlers in Arizona and New Mexico and were subdued by General Crook, after a prolonged campaign. They were then placed on the San Carlos reservation, under a government half-civil and half-military, the agency supplying their wants and the military acting as police. The C. are a brave race, whose boast had been that they had never bowed to civilized power.

CHITTENDEN, SIMEON BALDWIN: b. Ct. 1814: received an academic education; was prosperous in mercantile life in New York; elected from Brooklyn to XLIIIrd, XLIVth, XLVth, and XLVIth congresses. He has acted with the Repub. party.

CHOPPIN, SAMUEL PAUL, M.D.: 1828–80; b. La.; d. New Orleans: a well-known southern physician and sanitarian; studied medicine in this country and abroad; was resident surgeon of the Charity hospital, New Orleans, and demonstrator of anatomy; and was one of the founders of the New Orleans school of medicine. He was surgeon-in-chief on Gen. Beauregard's staff, in the late war; and was appointed pres. of the Louisiana board of health in 1876, in which capacity he made strenuous efforts in behalf of a strict enforcement of quarantine.

*CHOSE IN ACTION. The law relating to *choses in action* was formerly the same in the U. S. as in Eng. But in many states, as N. Y., the assignee of a *chose in action* is now allowed to sue upon his right in his own name. The assignee of a *chose in action*, however, takes it subject to all defences which might have been interposed to it had the action been brought upon it by the original owner.

CHRISTIANA: a hundred in New Castle co., Del.; 10 m. s. w. of Wilmington. There are 3 churches and 2 carriage shops. Pop. '80, 6,140.

CHRISTIANCY, ISAAC P.: b. N. Y.: studied law; admitted to bar in Mich.; prosecuting atty., 1841–46; delegate to national Free Soil convention, 1848; state senator, 1850–52: judge of the supreme court of Mich, 1858–75, during part of which time he was chief justice; elected U. S. senator, as a Repub., succeeding Z. Chandler, 1875; minister to Peru, 1879.

CHRISTIANSBURG: a magisterial dist., Montgomery co., Va.; including the post vill., Christiansburg, in which is the Christiansburg Female college. The dist. includes a part of the Blue Ridge, and is traversed by the Atlantic Mississippi and Ohio railroad. Pop. '80, 4,772.

CHRYSE: the name given by the ancients to regions now known as Indo-China. It is a literal version of the Sanskrit Suvarnabhumi, or Golden Land, applied in aneient India to those regions.

CHURCH, FREDERICK S.: American artist, whose specialty is animal and bird life; he does also satirical work. Among his pictures are "Weirdness," "Mad as March Hares," and "The Sea Princess," in oils; and "Hard Times" and "The Phantoms," in water colors.

CHURCHILL, RANDOLPH HENRY SPENCER, Lord: b. 1849; second son of the seventh duke of Marlborough. He graduated at Oxford, and since 1874 has represented Woodstock in parliament. In 1880, and for some time afterward, he was the leader of the so-called "fourth party" of extreme conservatives, whose energies were directed toward hampering and annoying the liberals, but latterly he has shown a disposition to act independently, and to create a democratic sentiment among the Tories.

*CHURCH WARDENS: in the Prot. Epis. Church of the U. S., are annually elected by each parish in Easter week; their duties, which are regulated by diocesan and not by general canons, being virtually the same as those of the corresponding English officials, omitting such as relate to a church established by the state.

CIGARETTE: a small cigar rolled in thin paper. The manufacture is comparatively new in the U S., as the extensive use of the article is recent here, though long in vogue in some southern countries. The leaves of the tobacco are first stripped, during which process atomizers are used to keep the tobacco at a proper temperature, and to destroy impurities. The leaves are then pressed and mixed in various proportions, according to the brand desired; after which the tobacco is rolled in paper wrappers, usually 3 in. long, 1 in. wide, and pasted with starch. Hydrometers are used in the packing room to denote the proper degree of humidity. The best wrappers are made in Switzerland of thin rice straw. C. smoking is pronounced by physicians to be productive of some peculiar injuries to health, due to the quality of the tobacco used, and to the mode of preparation; and some medical authorities have traced to this cause a peculiar form of heart palpitation.

*CINCINNATI. According to the census of 1880, the 255,139 persons composing

the population were divided as follows : native-born, 183,480, of whom 175,352 were white and 8,128 colored ; foreign born, 71,659, the prominent nationalities being Germans, 46,157 ; Irish, 15,077 : British, 4,225. It is in great part the influence of the large German element that has made C. the chief musical centre in the west. The portion of the city known as "Over the Rhine," which lies between the canal and the hills, is inhabited almost exclusively by Germans or their descendants, and is famous for its concert and beer-gardens. There are 201 churches in the city : Rom. Cath., 51 ; Meth., 37, including 5 colored ; Presb., 24; Prot. Epis., 19 ; Bapt., including 9 colored, 18 ; German Evan., 15 ; Jewish, 7, Disciples of Christ, including 1 colored, 6 ; Cong., 5 ; United Brethren, 3 ; Lutheran, 2 ; Friends, 2 : Dutch Reformed, Swedenborgian, Universalist, Unitarian, one each ; miscellaneous, 8. Besides the numerous private schools, there are three public high schools, an admirable normal school, and 40 common schools. In the latter the number of pupils enrolled in the school year 1883, was 34,388, of whom 17,608 were males. The total number of pupils attending other than public day schools was 15,504, but as in the same year there were nearly 90,000 children of school-age (6 to 21 years) within the city, the compulsory education law is not very strictly enforced. The number of newspapers and periodicals is 133 : 14 dailies ; 46 weeklies ; 1 semi-weekly ; 1 tri-weekly ; 47 monthlies ; 11 semi-monthlies ; 10 quarterlies ; 2 semi-annuals ; 1 annual. Twelve lines of railway enter the city, and are used by 21 companies : Cincinnati New Orleans and Texas Pacific, Louisville and Nashville, Cincinnati Washington and Baltimore, Pittsburg Cincinnati and St. Louis, Ohio and Mississippi, New York Pennsylvania and Ohio, Cincinnati Hamilton and Dayton, Cincinnati Hamilton and Indianapolis, Cincinnati Richmond and Chicago, Dayton and Michigan, Cincinnati Northern (narrow-gauge), Indiana Bloomington and Western, Cincinnati and Eastern (narrow-gauge), Cleveland Columbus Cincinnati and Indianapolis, Grand Rapids and Indiana, Chesapeake and Ohio, Cincinnati Indianapolis St. Louis and Chicago, Toledo Cincinnati and St. Louis (narrow-gauge), Cincinnati and Westwood, Cincinnati and College Hill. Formerly C. was at the head of all American cities as a centre for the pork trade, but it has of late been outstripped by Chicago. In 1882 there were slaughtered 384,878 hogs, as against 522,425 in 1851. In the former year there were 173 pork-packing establishments, employing 1,950 persons. The iron manufactures are rapidly increasing and will soon hold a leading position among the industries of the city. The total value of all these manufactures in 1881 was $20,557,783, the number of hands employed being 11,874. C. is the principal leather market in the west, and the second in the U. S. In the production of harness it ranks first in the U. S., and in that of boots and shoes it ranks second. The value of the leather and the leather goods produced in 1881 was $13, 320,786 ; the number of hands employed, 7,502. The manufacture of furniture is assuming large proportions, the city being admirably adapted for the prosecution of this industry, as the region surrounding it produces the best quality of both hard and soft woods. In 1883 $7,792,363 worth of furniture was produced, employing the labor of 3,364 persons. Coffins and burial cases are also extensively produced, and the manufacture of carriages and wheeled vehicles of all descriptions is rapidly increasing. The latter industry, in 1883, employed 4,120 hands, whose total production was valued at $9,935,112. The breweries of C. are famous. The district in which the city is situated pays to the U. S. a larger internal revenue than any other district in the country. In 1883 the total tax was $10,585,734. There are 27 malt liquor breweries, producing annually about 26,000,000 gallons, valued at $6,500,000. In addition, about 15,000,000 proof gallons of distilled liquor are manufactured every year. The annual value of the tobacco products is from $4,500,000 to $5,000,000. The city debt is $23,907,474 ; the total assessed value of real and personal property at the beginnng of 1884 was $166,925,286 ; and the rate of tax levy 2.05 per cent. The most memorable event in the recent history of C. was the riot of 1884, March 28–31—the direct result of a series of shameful miscarriages of justice, against which the people at length rose in indignant revolt. An armed mob assaulted and broke into the jail with the intention of lynching the murderers who had escaped the full penalties of their crime, but their purposes being frustrated, they burned the court-house and other buildings. The state militia was called out to suppress the tumult, and 45 persons were killed and 138 wounded before order could be restored.

End of Vol. III.

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